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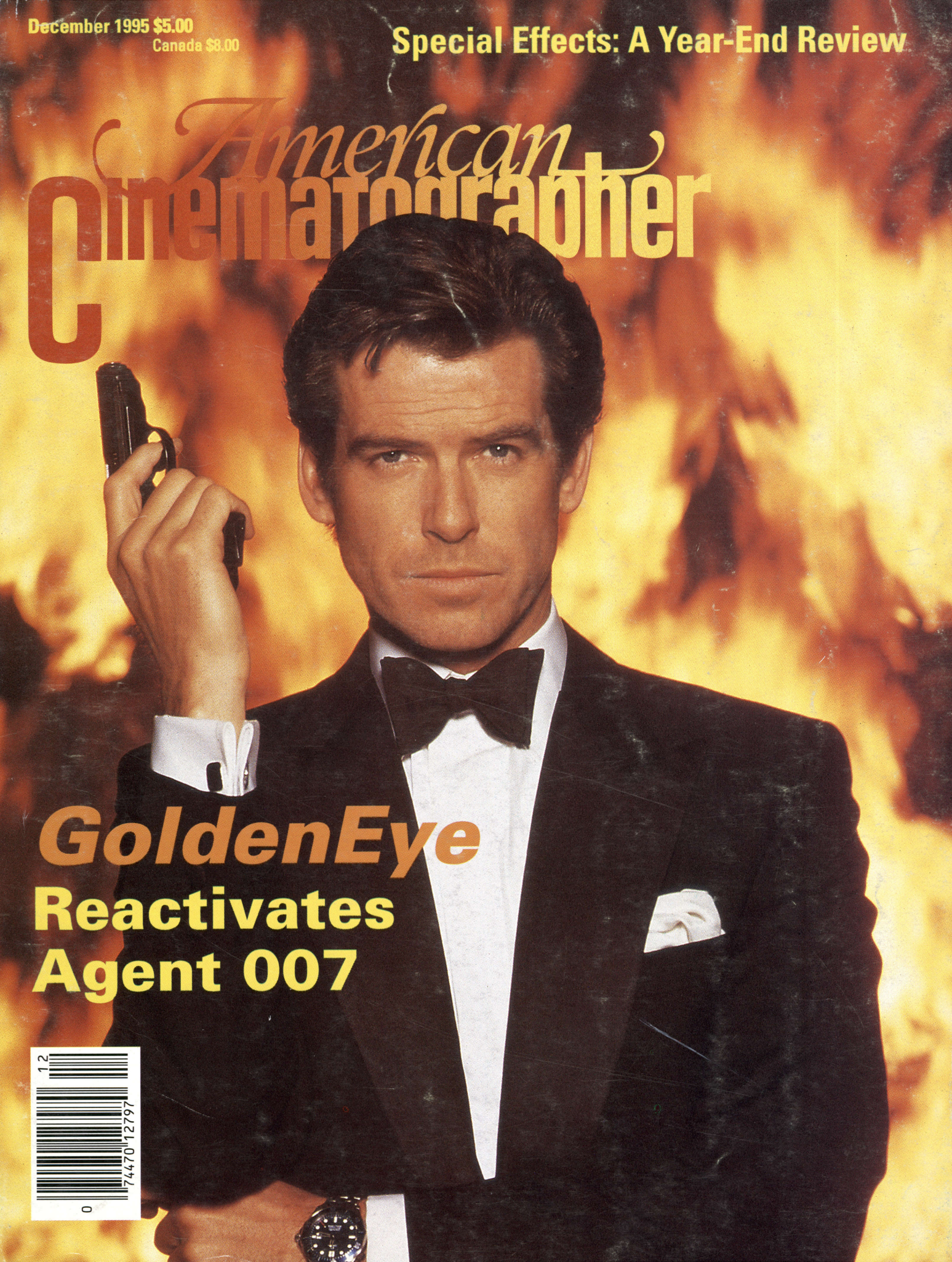
American Cinematographer



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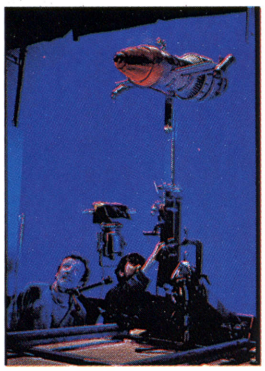

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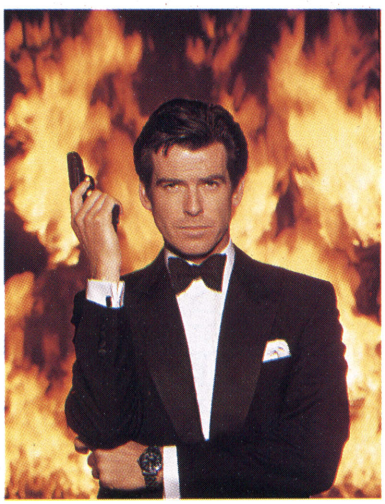

On Our Cover:
Pierce Brosnan heats up the screen as the new James Bond in *GoldenEye,* directed by Martin Campbell and photographed by Phil Méheux, BSC (photo by Terry O'Neill, courtesy of United Artists Pictures Inc.).

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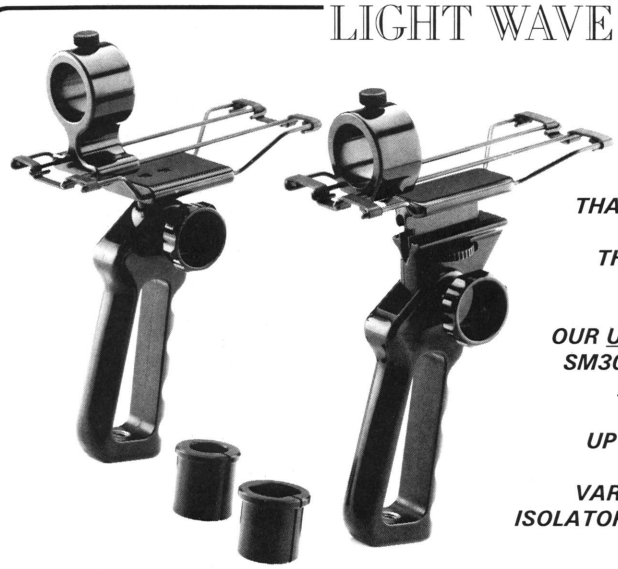

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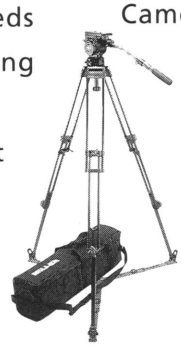

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People have been asking: "What's the *lowest* camera you have?" So we've had these two built: 6¾ inches tall.

Brand new 1950s Mitchell

It's a 35mm Mitchell GC, modified and updated to our specs by Fries Engineering. Manufactured during the late Fifties but never used. When we bought these two, film had never been run through them.

GC means Government Camera. Mitchell built three of this low-profile model, for the U.S. Navy. Jacques Cousteau uses one; we have the other two.

Pin-registered high-speed movement, 200 foot loads

The original camera has a registration-pin movement that can run at up to 120 fps, a 200 ft magazine—and no viewfinder. The magazine takes darkroom loads. As you can see, it mounts on the rear. As you can also see, so does the motor.

Reflex viewing, video tap, PL mount

Fries Engineering has put a spinning-mirror reflex front on our camera, together with optics for a video tap. Non-adjustable 180° shutter. The side-mounted video tap adds no height; the viewfinder rotates through 360.° PL lens mount; the lens on the camera here is a Zeiss 85mm T2.1.

Filter slot at the aperture

There's a standard Mitchell hard-matte slot just in front of the aperture plate; you can slide the gel filter of your choice in there. And, of course, we have Series 9 (and bigger) glass filters and mounting adapters.

Motor lets you use modern electronics

It's a modified Fries motor that gives you crystal control at 24 and 30 fps. You can plug in most of the electronics available at Clairmont: Strobes, Precision Speed Control, Film/Video Synchronizer, Electronic Projector Interface, HMI/TV Sync Box (crystal at 7.5, 15, 24, 30, 40, 60 and 120 fps). We've added an electronic tachometer and footage counter.

Height compared with other cameras:

With video tap, our Mitchell GC is 6¾ inches tall. That's 1¾ inches lower than an Eyemo, 5¾ inches lower than an ARRI 35-3 with shoulder magazine and video tap, 8¾ inches lower than a 35BL with its video tap.

Other specs:

It's 11½ inches wide with video tap and viewfinder, 8½ inches wide without viewfinder. Without lens, it's 28 inches long and weighs 35 pounds. Camera base to lens axis is 3⅜ inches; lens axis to top of camera is the same. (On the BL and the Type 3, camera base to lens axis is 4⅛ inches.)

For flying: two sockets

Obviously, this camera is a natural for flying through tight spaces—car windows, for example. To make it easier to fly, we've installed two standard tripod sockets on the camera: one on the bottom, one on the top.

Camera driven over by a car

Before we took these pictures of this GC camera, Director of Photography Bob Steadman drove a car over it for an Oldsmobile commercial. First Assistant Kim Guthrie and the crew made an indentation in the asphalt with an impact hammer and positioned the GC camera horizontally.

How low can you get this camera?

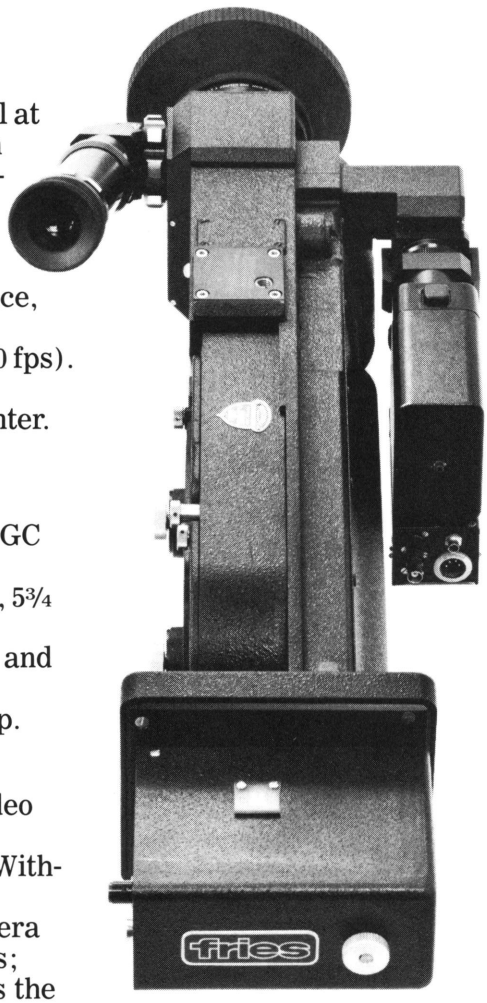
The ARRI Standard Mount Zeiss hard lenses (16, 24, 32, 50 and 85mm) all have barrels a hair over 2 inches in diameter. So there's a little over 2¼ inches between the bottom of those lenses and the GC camera base.

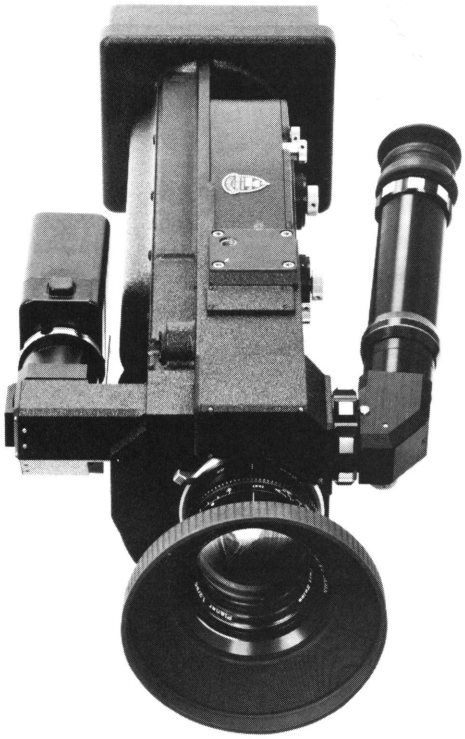
Top of camera 4½" above ground

If you position the camera with its base 2¼ inches below ground, the bottom of those Standard Mount lenses will be at ground level. The top of the camera will then be almost exactly 4½ inches above ground.

Std mount lenses on a PL mount camera?

The outside diameter on these Standard mount lenses is about an inch smaller than the PL mounts in the same focal lengths—so you can get the camera a half inch lower. If you're going to run a car over it, every little bit helps.





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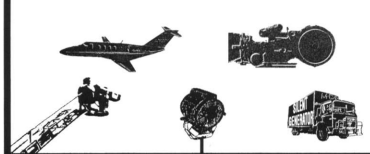

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Letters

NFL Coverage Earns Extra Point

The recent NFL Films article (*AC* Oct. '95, by Chris Pizzello) was great, and sheds some light on why it is impossible to channel-surf past an NFL Films Presentation. The recognition of Steve Sabol, Phil Tuckett, and Hank McElwee is well deserved. After all, those three guys would be one, two and three on the list of who has shot the most film footage — ever. I would like to mention that NFL Films does not go on vacation during the off season, and several of their awards have followed work done for outside clients. I worked with Phil and Hank on special projects for ABC, ESPN, and Fox, and I can attest that their energy, enthusiasm, and willingness to push the envelope is something you have to see to believe.

— Russell Steen
Los Angeles, CA

Thanks for the thumbs-up, Russell; we also felt that NFL Films deserved comprehensive coverage. Unfortunately, we should point out that there were several glitches in the article due to fumbles by our usually reliable staff (including yours truly). On page 70, in the photo caption, Hank McElwee (bottom photo) was incorrectly identified as Phil Tuckett. We humbly offer our sincerest apologies to Mr. McElwee, who certainly deserves the proper recognition. On page 78, we also declared that The 100-Yard Universe *was shot with a "Cinemascope Panavision 70 camera." In addition to being an unfortunate oxymoron (as we all know, Cinemascope is a process of the past), this information is incorrect: according to Sean Manton of Panavision,* The 100-Yard Universe *was actually shot with a Panavision Panastar camera.*

As a result of these bloopers, the staff of AC *has been assessed a full 15-yard penalty.* — *Ed.*

Anamorphic Response

I agree with the October Letters contributor who suggested that more films should be made in anamorphic and 65mm formats, especially considering today's budgets — mainly because of the superior quality after reduction to 35mm Scope as shown in most theaters. Since the 1970s, the average image quality of American films has declined, although film stock, lenses and cameras have been greatly improved. Most 1960s films look good today because they were shot in anamorphic processes like Panavision. No other format makes better use of 35mm film in all stages of production.

Using Super 35 cheats the spectator of the very best visual quality. It's true that film stocks have been improved greatly, so you *can* get good results with Super 35. They said the same in 1954 about SuperScope and in 1962 when TechniScope was introduced. If you take enough care and respect the limitations, it can be done. But the same film would look so much better in anamorphic format, using the 70% bigger negative area.

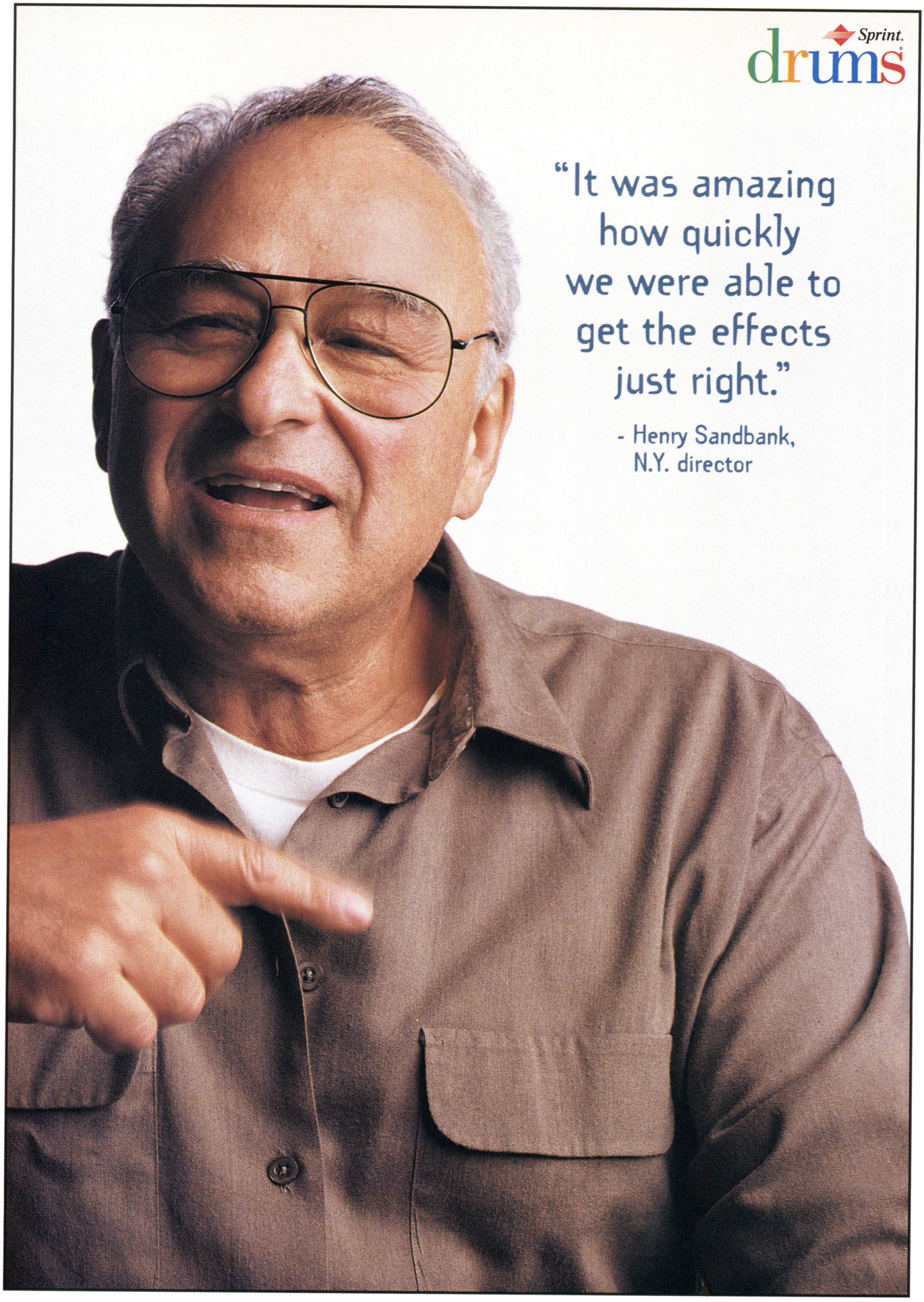
In the days of SuperScope, anamorphic lenses were rare and expensive. Today we have high-quality, high-speed Scope lenses in a wide variety of focal lengths. Techniscope used a 2-perf pitch and saved 50% of raw stock, which attracted low-budget producers. No such excuse exists for those modern cinematographers who talk about how wonderful Super 35 is to work with.

Many impressive Scope films of the past used Steadicam, handheld camera and difficult camera movements. After all, motion pictures are made for an audience's delight, not for the cinematographer's convenience.

Author, Author!

In your mention of the book *Optics and Focus for Camera Assistants* (*AC* October) I was disappointed to see that the reviewer neither told us who wrote this book, nor took the time to find out that the author is Fritz Hershey, a well-known local first assistant with vast experience.

It's rare that a person of Mr. Hershey's knowledge and skill is willing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- Henry Sandbank, N.Y. director

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(or able) to take the time and expend the energy to write a book like this, which gives us the benefit of his insight into the art and mechanics of focus.

In our small cinematographic community, credit due for work such as this is very important, and should be trumpeted on the rooftops! Bravo, Fritz, for writing your book!

— Alex Funke
Los Angeles, CA

We apologize for omitting the author's name, but should also mention that the New Products *column, in which the item appeared, is culled from press releases from manufacturers, facilities, and publishers; no product or service featured in that section has been tested, researched or reviewed by our staff.*

If you'd like information about Optics and Focus for Camera Assistants, *please call Focal Press at (800) 366-2665, FAX (800) 446-6520.*

Clarifications

In the photo accompanying our story on the 1995 Emmy Awards (*AC* Oct.), we identified George Spiro Dibie, ASC as "I.A.T.S.E. President." Mr. Dibie has pointed out that while he is the president of the International Photographers Guild (camera local 659, one of 500 locals that falls under the umbrella of I.A.T.S.E.), the president of I.A.T.S.E. itself is Thomas C. Short. *AC* regrets any misunderstanding that the caption may have caused.

In Ron Magid's story "Cutting Up the Rug" (*AC Oct.*), outlining Industrial Light & Magic's CG contributions to the commercial "Stylin'," ILM animator Colin White was misidentified as "Carl White," while technical director Steve Braggs was referred to as "Steve Bragg." We regret the errors.

Please send any comments or suggestions to Letters to the Editor, American Cinematographer, *P.O. Box 2230, Hollywood, CA 90078. Or reach us online at* ASCMAG@aol.com. *We also welcome information on new products or noteworthy projects, developments or collaborations; please direct such material to the attention of the Assistant Editor.*

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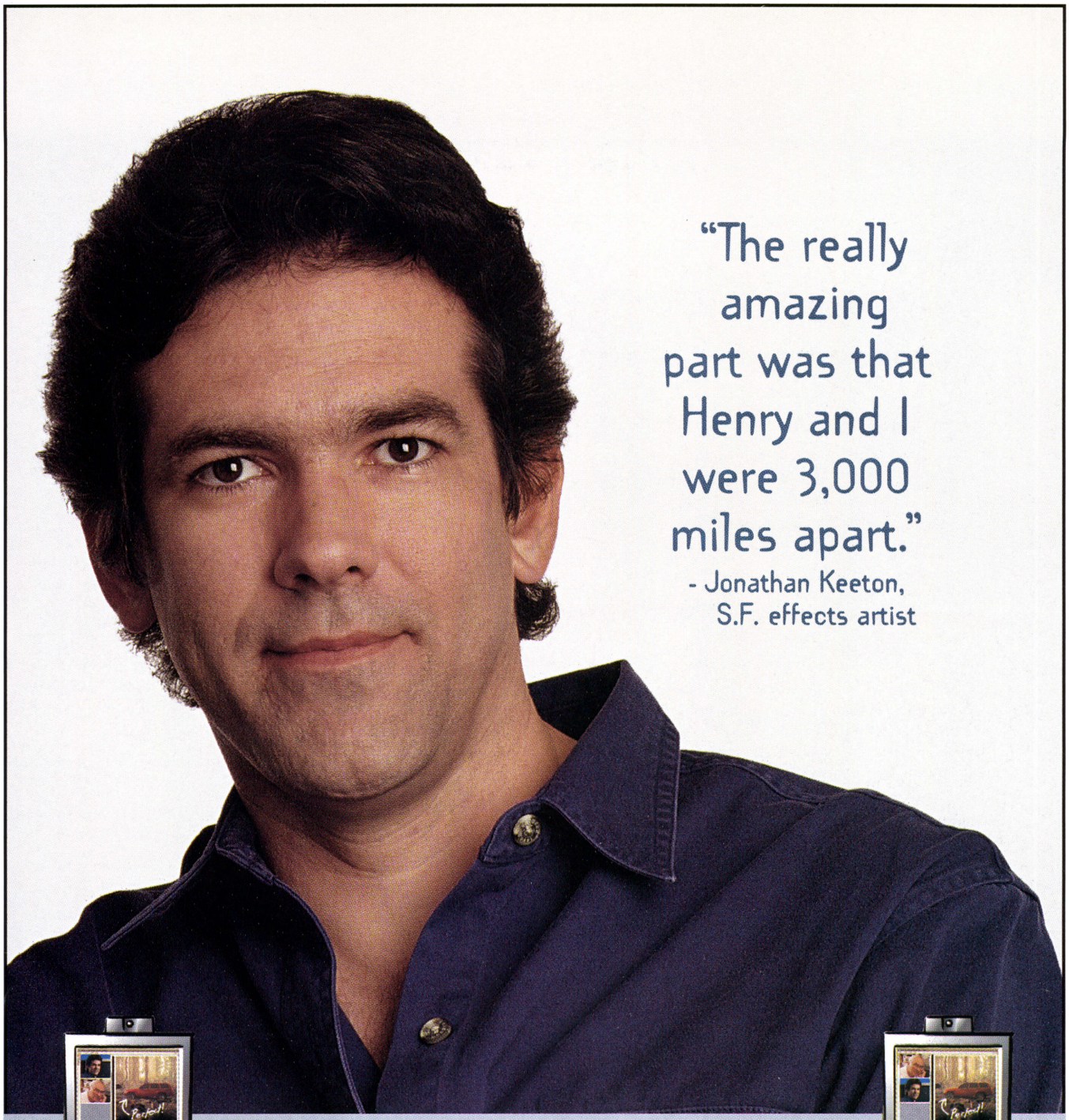
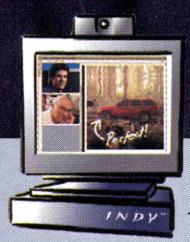


"The really amazing part was that Henry and I were 3,000 miles apart."

- Jonathan Keeton, S.F. effects artist



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A Memorable Celebration

Filmmakers from around the world display their talents in elegant surroundings.

by Stephen Pizzello and Brooke Comer

An editorial life can be taxing.

In addition to the insistent pitches of writers and publicists, deadlines that loom like the Sword of Damocles, the earnest demands of loyal readers and other sundry pleasures of the ink-stained life, magazine editors and journalists must occasionally trek off, credentials in hand, to far-flung locales to track down stories that might otherwise elude them if they remain snugly ensconced in an office. Life is no different here at *American Cinematographer.* Without a firsthand investigation of the fertile festival circuit, we might miss out on a selection of intriguing films that often escape wider exposure — and thus deny our readers the kind of coverage they have come to expect. *It's a tough job. . .* et cetera.

Fear not. It was in this spirit of responsibility that *AC* editor Stephen Pizzello and East Coast correspondent Brooke Comer set off for the 19th Montreal Film Festival, held from August 24 through September 4 in one of Canada's most cosmopolitan cities.

Having returned from our crusade, we are pleased to report that the job was not as daunting as it first appeared. True, there was the problem of selecting from the overwhelming schedule of screenings, comprising hundreds of films from dozens of countries. We also had to make critical choices in regard to cocktail parties, dinners, V.I.P. receptions, and other important assignations arranged by our ever-gracious hosts. Nevertheless, we soldiered on, Murrow-style, in the interest of thorough reporting.

Like most other festivals, Montreal's yearly fete offers an official competition as well as a general selection of films whose creators are eager to attract positive word-of-mouth and/or a responsible distributor. This year's jury consisted of a half dozen experts with impeccable credentials: esteemed French film critic Michel Ciment, the author of numerous literary works about cinema; *Newsweek* critic Jack Kroll; film historian and critic David Robinson (whose biography of Chaplin was adapted for the screen by director Richard Attenborough); filmmakers Jacques Godbout and Hans W. Geissendörfer; and highly respected Korean actress Yun Chung-Hi. Serving as the jury's honorary chairperson was legendary French actor Gérard Depardieu.

The results of the official competition were as follows:

FEATURE FILMS

Grand Prix of the Americas (Best Film): *Georgia* (France/United States);

Special Grand Prix of the Jury: *A Moslem* (Russia);

Best Director: Xie Fei, *A Mongolian Tale* (China), Goran Markovic, *Burlesque Tragedy* (Bulgaria/France);

Best Actress: Jennifer Jason Leigh, *Georgia;*

Best Actor: Fabrizio Bentivoglio, *Un Eroe Borghese* (Italy);

Best Screenplay: *Passover Fever* (Israel), by Shemi Zarhin;

Best Artistic Contribution (music): Tengger, *A Mongolian Tale;*

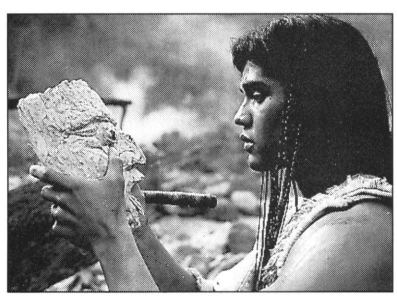
Special Grand Prix of the Americas: The Festival and the Jury recognized the exceptional contribution of Liv Ullmann as an actress and a film director during the presentation of her new film *Kristin Lavransdatter.*

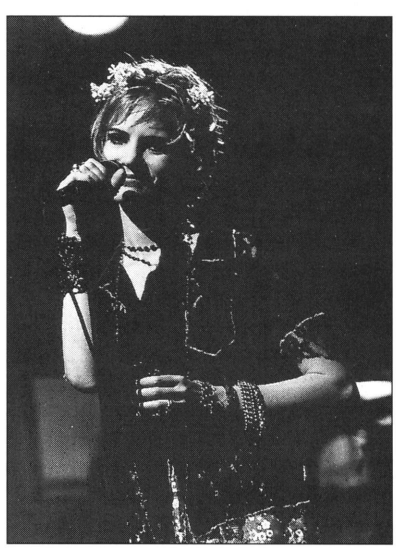
SHORT FILMS

First Prize: *The End of the World in Four Seasons* (Canada);

Second Prize: *Clocks* (Germany)

Although *AC*'s intrepid reporters were unable to screen every film at the festival, we did see a number that deserve special mention. *Warrior Lanling,* a dreamlike epic about enemy tribes in ancient China, strove to tell its story almost exclusively with images; the film's sparse use of dialogue was a risky tactic, but the power of the film's visuals kept viewers entranced. Directed by Sherwood Xuehua Hu, with stunning cin-





***A trio of festival favorites,* clockwise from top: *Lorenzo Callender as* Warrior Lanling *(China); Jennifer Jason Leigh belts out a tune in Best Film winner* Georgia *(France/United States); director Talia Shire with actresses Elsa Raven and Ally Sheedy during filming of* One Night Stand.

Photos courtesy of Vanke Films Company, Ltd. *(Lanling),* Georgia Film Corporation *(Georgia)* and Concorde-New Horizons Corp. *(One Night Stand).*

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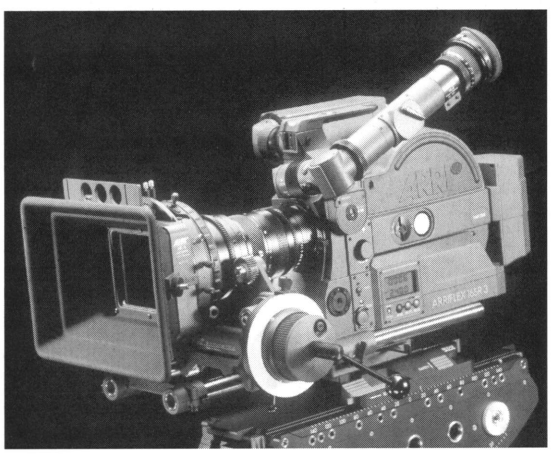

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ematography by the duo of Hou Yong and Gu Changwei, ASC, the film traces the Faustian downfall of a young prince who discovers a magical mask that helps him lead his tribe to victory — and then exacts a heavy price on his soul.

Another impressive Chinese entry was *Shanghai Triad,* the latest dazzler by master director Zhang Yimou (*Raise the Red Lantern, Ju Dou, The Story of Qiu Ju*), who was honored by the festival at a special reception. Set in the 1930s, the film relates the adventures of a 14-year-old boy who gains a job attending to the haughty mistress of a Triad gang boss. Like all of Yimou's films, *Shangai Triad* is a veritable clinic in gorgeous cinematography, courtesy of cameraman Lu Yue.

One of the festival's subtler pleasures was the Norwegian film *Cross My Heart and Hope to Die,* a trenchant coming-of-age tale about a young boy who endures a series of surrealistic mishaps during his summer vacation. An absorbing feature debut by 30-year-old director Marius Holst, the film benefits from the rich, understated photography of Philip Ogaard.

A hilarious Israeli entry, *Passover Fever,* offered a wry, nostalgic look at one family's uproarious holiday get-together. Like the best films of Woody Allen, the film mixes mirth and wisdom in equal measures; it marks the feature debut of director Shemi Zarhin, and was photographed by Amnon Zalait.

For racier tastes, the festival offered the indescribable *New Love in Tokyo,* a deliriously postmodern mixture of S & M and slapstick from Japan. Tracing the adventures of a would-be actress who earns her living as a cruel but queenly dominatrix, this highly unusual picture juxtaposes beautifully lit scenes of campy kink with the shaggy-dog adventures of an aspiring troupe of thespians. The brainchild of director Banmei Takahashi, who began his career by helming a series of "pink films" (soft-core erotica), this one-of-a-kind picture benefits from some truly striking cinematography by Naoki Kayano.

During the course of the festival, *AC*'s envoys were able to meet with the makers of several other notable films whose visual styles deserved special notice, often for very different reasons. What follows are short visits with the creators of five films that are well worth seeking out. — S.P.

Feast of July (Great Britain)
Director: Christopher Menaul
Cinematographer: Peter Sova

Selected as the festival's opening-night film, *Feast of July* is the emotionally wrenching tale of an English country family that is ripped apart when it decides to take in a young woman who has been impregnated and abandoned by a rakish young man. After producing a stillborn child during a long trek across wind-swept moors in the winter of 1883, Bella Ford (Embeth Davidtz) arrives in Addisford, the town where her lover, Arch Wilson (Greg Wise), had said that he lived. She soon discovers that he has lied to her, but settles in with the Wainwrights, an accommodating couple whose three grown sons vie for Bella's

affections. After a prolonged courtship, Bella decides to marry the youngest son, Con (Ben Chaplin), but the couple's happy engagement turns into a nightmare when Bella's ex-lover suddenly reappears.

Director Christopher Menaul says that he was drawn to the project primarily because it afforded him the chance to create the world described in the script. "I'd seen films with beautiful English countryside in them, and I'd seen films with industrial squalor, but I'd never seen the two juxtaposed in quite the way they are in this story," he says. "The people in the film live in these cramped little houses on cobbled streets with smoky factories at the end, yet they're within a few minutes' walk of unspoiled countryside. I liked that visual tension. I wanted the film to look rich, but I didn't want it to look pretty. I was after a sense of realism, which a lot of English films don't have; a lot of them are too 'chocolate box' for me. I really wanted to avoid that sort of look."

Feast of July marks Menaul's first foray into features after an award-winning career in British television, during which he helmed such acclaimed projects as 1991's *Prime Suspect.* "In many ways, this project was easier than working in television," he reveals. "It was modestly budgeted, so we didn't have to deal with the pressures that you'd get with a big-budget studio picture. And after 20 years spent trying to cram action into a small frame, it was refreshing to have a wide screen to play with."

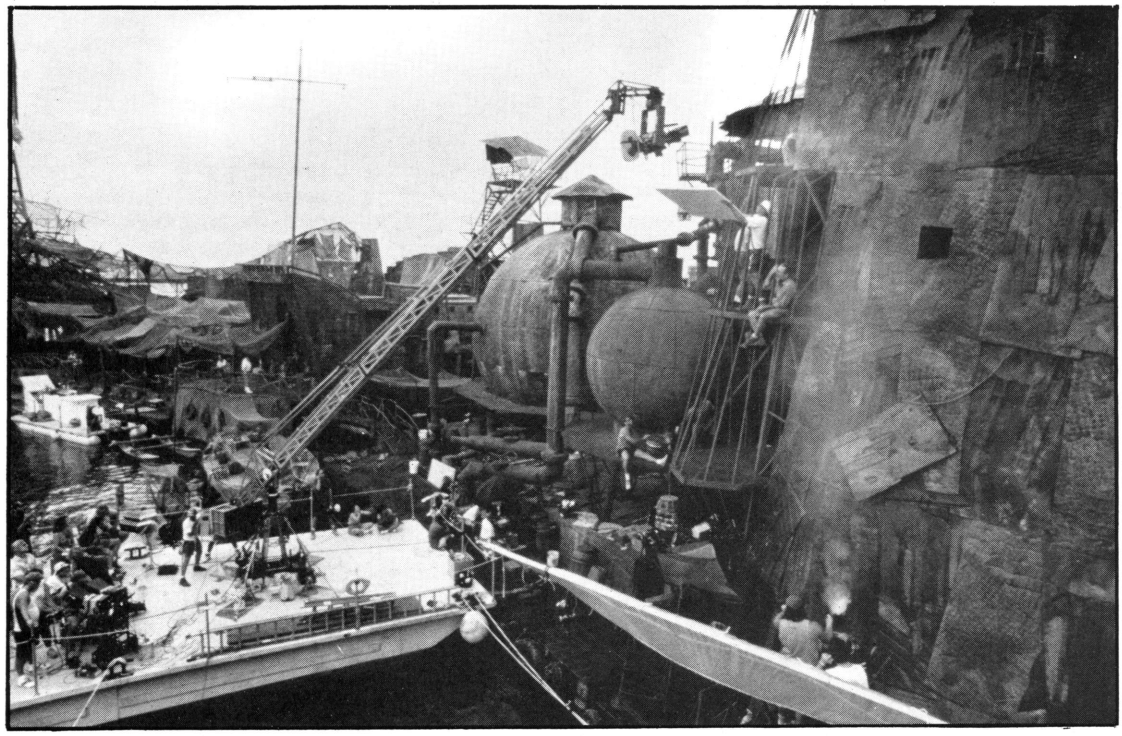
The filmmakers chose to shoot in Super 35 to lend the story sweep, but also to heighten the sense of claustrophobia in the tiny interiors. "Composing for 2.35:1 in those small spaces was very difficult," Menaul concedes. "We tended to sit back and use long lenses in order to compress things."

In preparation for the nine-week shoot, the filmmakers sought out locations that were within reasonable distance of each other, while avoiding any modern vistas. In the end, they managed to combine the industrial streets of the Midlands, cornfields in Wales, a port in Devon, a river in Shropshire, and a prison exterior in Oxford. The film's impressively authentic interiors were designed by Christopher Robilliard.

To bring the look together, Menaul enlisted the aid of cinematographer Peter Sova, whose resumé includes four films with Barry Levinson (*Diner, Tin Men, Good Morning, Vietnam* and *Jimmy Hollywood*) as well as HBO's *Fatherland* with Menaul (which earned Sova an Emmy nomination). "We shot in Super 35 because I wanted to keep some of the depth for the interiors," says Menaul. "Because we were often using longer lenses, I didn't want things to become too flat. When we shot the landscapes, we had more freedom to open up the imagery, which of course relates to the theme of the film."

Sova used Kodak's 5298 for his interiors, even though he was a bit concerned about seeing grain after the optical process. "The darkish backgrounds we had in this film took care of that," he notes. "Plus, I always overexposed by about three-quarters of a stop to get a good negative." For exteriors, he used 5248, but he resorted to 5293 for one low-lit scene in the woods, during which two of the brothers engage in hand-to-hand combat with farming tools. Sova's camera of choice was a Panavision Platinum outfitted with Primo lenses. "I think you get a bit more contrast with the Primos," he submits. "It's a bit easy to slip into pretty photography when you're shooting with long lenses, so I went to extra trouble to give the film

Photo by Stephen Morley, courtesy of Feast Prod., Ltd.



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a realistic look."

Feast of July, which is being distributed by Touchstone Pictures, opened in the U.S. on October 13. — S.P.

Georgia (France/United States)
Director: Ulu Grosbard
Cinematographer: Jan Kiesser, ASC

Ulu Grosbard was caught off guard when his film took home the prize for Best Film. Somewhat sheepishly, he admits, "I had no idea what other films were in the competition. It was a very pleasant surprise."

Grosbard was intrigued by the script, which was written by Barbara Turner, the mother of actress Jennifer Jason Leigh, whose role in the film brought her the Best Actress prize in the festival competition. *Georgia* examines the relationship between Sadie, an unstable, substance-abusing would-be rock singer, and her older sister Georgia (Mare Winningham), an established recording star.

"To come across a screenplay that was fresh and true and had something to say was unusual, and I responded immediately," says Grosbard. There are always particular tensions in a family, even when the members love each other. Often one family member is more successful than another and that disparity disrupts the course of their lives. I'm fascinated by people who have a passion for work they're not particularly talented at doing. You see that conflict often. Some people make an adjustment and have a very good life. Some don't. It's quixotic."

Grosbard had never worked with cinematographer Jan Kiesser before, but he'd seen his work on *Clean and Sober* and *Mrs. Parker and the Vicious Circle*, both of which also deal with the issue of substance abuse — although Grosbard never considered this link at the time. "I was going for a look that was vulnerable, edgy and a little rough," says Grosbard.

Once the general look had been decided, Grosbard and Kiesser discussed ideas for each scene. "I had great faith in Jan," says the director. "We had a very tight schedule and budget, which dictated a lot of our shot decisions."

Grosbard likes to rehearse his actors, block scenes, and then consult with his cinematographer in terms of where to put the camera and how to color a scene. "When you work with very good actors," he points out, "you want to take advantage of what they have to contribute. No matter how much planning I do in terms of blocking, I always like to give them leeway to see what they come up with on their own. Good actors have a sense of wavelength; they will adjust their relationships to the physical surroundings, and to the behavior that the characters in the scenes demand, in a very instinctive way."

In one kitchen scene at Georgia's farmhouse, Georgia cooks a Thanksgiving dinner while she and Sadie share a crucial exchange. "The fact that Mare was cooking anchored her movements, so the question was where Jennifer would be in relation to her," says Grosbard. "I let Jennifer find where it felt to be right and she came up with a specific chair. It worked. She knew where to be."

The film's many music scenes posed potential problems. "One major requirement in the casting," says Grosbard, "was to find an actress who could credibly portray Jennifer's older sister, and also convincingly play a singer." Winningham turned out to be not only a friend of screenwriter Turner and her daughter, Jason-Leigh, but a professional singer as well.

Grosbard, whose musical acumen lies primarily in the realm of classical, had to do extensive research for *Georgia*. "I listened to a lot of rock and roll, which I hadn't been exposed to growing up," he says. When he arrived in Seattle, where the movie was shot, he visited the clubs and studied the way musicians lived. "One reason why the musicans in the film come across with such realism is because they really are musicians, and we filmed those scenes in real clubs," says Grosbard, who cast professionals in the roles of supporting bandmembers for Georgia and Sadie's bands.

The music sequences themselves demanded four Panavision cameras, "and I would have used even more cameras," says Grosbard, "if we could have afforded it." He adds that Kiesser used the jib a lot, for the fluidity and motion it gave the film. "We used Steadicam a few times, in places where it would have been too tricky to lay tracks, and we had one very long dolly shot, when Mare and Max Perlich, who plays her husband, walk down a street. The only time we used a handheld cam-

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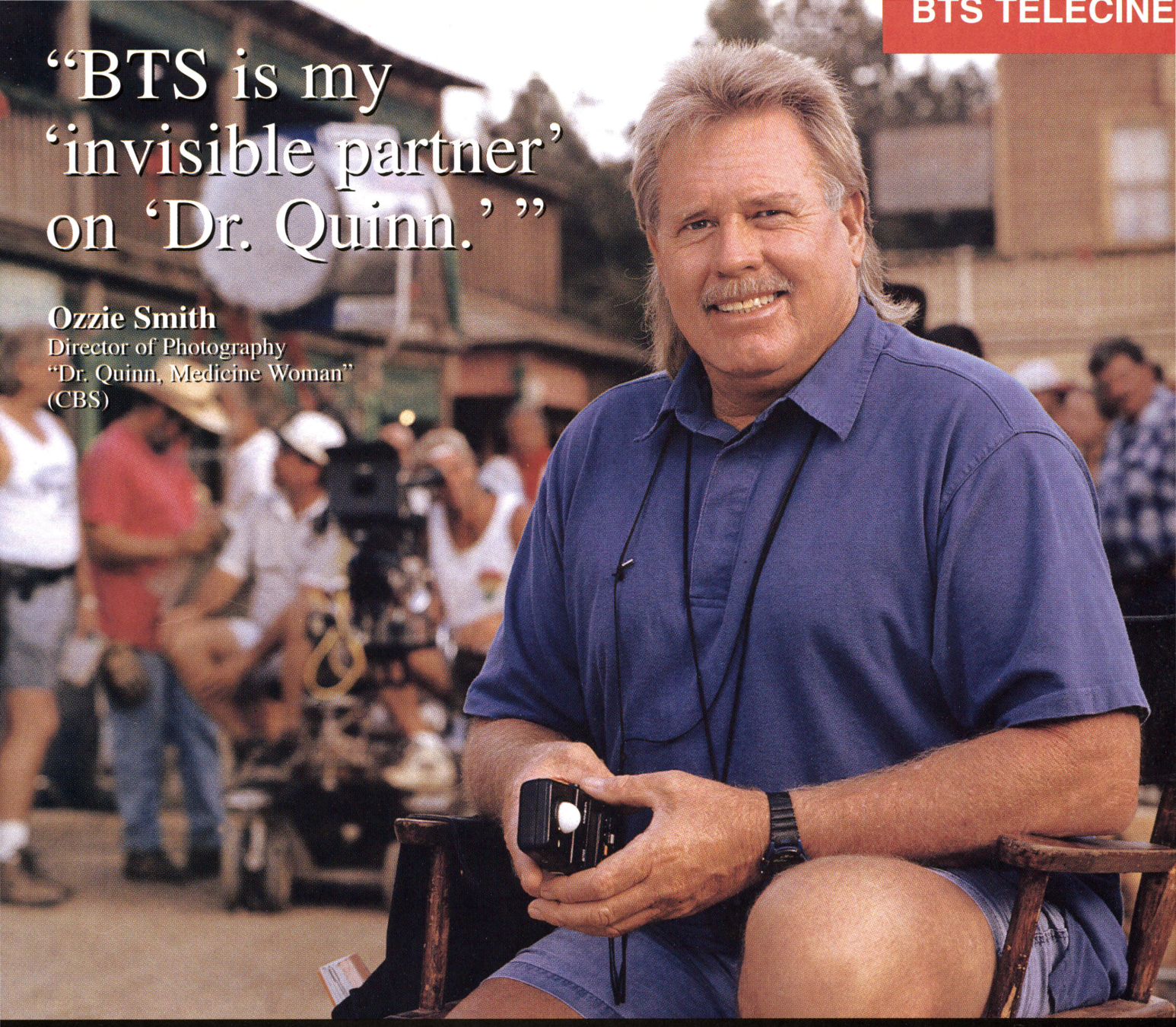

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"We had a lot of problems, as every picture does," he concludes. "But each time we were lucky. We found a solution." —B.C.

Delinquent (United States)
Director: Peter Hall
Cinematographer: Todd Crockett

A truly independent effort, *Delinquent* was a labor of love for first-time director Peter Hall, who enlisted the aid of cinematographer Todd Crockett (*Alligator Eyes*) in bringing his semi-autobiographical script to the screen. An anti-war activist and ex-journalist who once freelanced for *Rolling Stone, The Village Voice, Mother Jones* and other publications, Hall's filmmaking debut is a haunting and incisive tone poem about teen angst. The story concerns Tim (Desmond Devenish), a 15-year-old boy trapped in an abusive relationship with his alcoholic father (Jeff Paul), a small-town cop whose life has deteriorated after the death of his wife. Seeking escape from his father's ferocious tirades, Tim wanders away from the trailer they share and soon stumbles upon the vacant summer house of a wealthy family. After breaking into the dwelling, Tim begins rifling through the possessions of Tracy (Shawn Batten), a pretty teenage debutante who is away at boarding school. As his father's ill temper worsens, Tim entertains an imaginary relationship with the girl he has never met, until her unexpected arrival at the house triggers a series of tragic events.

"A lot of first-time directors will try to prove their manhood by showing their chops to the world," Hall says. "But I wanted to make something that would communicate an emotional state in a dramatic fashion. Without access to the marketing world, I felt more secure in telling a truth that I knew very well. I wrote the script from my own memories of what it was like to be a teenager with a very troubled family. This movie is about the dark side of adolescence."

Hall managed to finance the project with a combination of cash savings and credit, and borrowed the house location from some Dutch friends who were in Africa working for UNICEF. An ardent admirer of Hitchcock and Kubrick, the director also appreciates the independent spirit of films such as *My Beautiful Laundrette* and *Laws of Gravity*. "Those films make you realize that you really can create a film if you have the initiative," he says. "They were made with wit, grace, and a total knowledge of their own economic limitations."

Hall confronted similar restrictions on *Delinquent;* without access to either a dolly or a crane, he and cinematographer Crockett shot nearly the entire picture on a tripod, with two scenes handheld. The production did have access to HMI lights for a short period, but went back to a smaller tungsten package when the bigger rigs proved too cumbersome. Hall says that he hired Crockett

Photo courtesy of Peter Hall and Big Bad Productions

because he felt that the cameraman was willing to work on the fly. "I interviewed several cinematographers, and most of them came in talking about powerful camera packages, and their own set way of doing things. When Todd came in, he had the flu, and he brought along these paintings and sketches he was doing. He was humble, and I liked him immediately."

While scouting the film's locations, the duo blocked out various scenes in advance. Crockett shot the film with an Arri SR-2 outfitted with Zeiss Superspeed prime lenses (as well as the Zeiss 10-100mm zoom and an old Angenieux 25-250mm zoom), using Kodak's 7245 and 7296 16mm stocks. Dailies were printed at Technicolor New York, and the footage was later blown up for 35mm release by John Allen in New Jersey. "John is incredible; he just lavishes attention upon you," Crockett enthuses.

Bearing in mind that the film would be blown up to 35, Crockett framed and lit accordingly, striving for a lyrical use of contrast. "In lighting *Delinquent,* I applied some fundamental principles from my painting background," he says. "I tried to work with the face or human figure and its juxtaposition against the background. I would either keep the face or figure light and the back-

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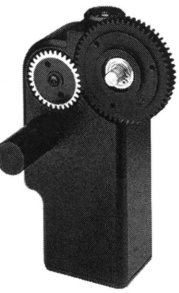

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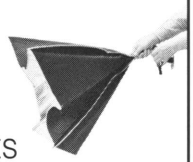

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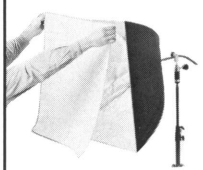

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ground dark, or work with mid-tones on the actors against a brighter background. That approach makes everything seem more three-dimensional, and creates a kind of 'apparent sharpness' that really lends itself to a blowup. If the film had been more flatly lit, it would not have blown up as well."

In order to heighten the film's Grimm-like fairy-tale aura, Crockett placed special emphasis on silhouettes, which he feels are "more dreamlike, and less real." One of his favorite moments from the film is a shot of Tim when he first approaches the house. "He was strongly backlit, in magic-hour light, and we used an old 25-250mm Angenieux zoom, which lent the visuals a very dreamy, misty quality. It wasn't the sharpest lens in the world, but it was the perfect lens for that situation. When Tim entered the house through a basement doorway, we switched perspective to the inside of the house, and showed him in perfect silhouette. The silhouette shots in the house were intercut with shots of his feet moving in and out of darkness, which helped create the sense of contrast I mentioned earlier."

Delinquent's edgy merits did not go unnoticed at the Montreal Festival, and the film was recently picked up for worldwide distribution (excluding the U.S.) by Beyond Films of Australia. "We were thrilled with this acquisition, which underscores Beyond's commitment to represent quality and commerical non-Australian feature films," said Beyond's General Manager, Gary Hamilton. Echoing that enthusiasm, Hall added that he and Crockett are currently prepping for their second collaboration. — S.P.

Chungking Express (Hong Kong)
Director: Wong Kar-wai
Cinematographers: Christopher Doyle, Lau Wai-keung

The two parallel tales that comprise *Chungking Express* are never woven together, but the chaos and ambiguity that this lack of cohesion creates lends to director Wong Kar-wai's story of life in the heart of Tsimshatshui, Hong Kong's main tourist area. The curry shops, bars, markets and small hotels enclosed in this labyrinth create a colorful, anonymous backdrop.

In the film's first story, a mysterious Chinese woman in a blonde wig and sunglasses hires Indians to smuggle heroin out of the country. When they disappear with the goods, her American dealer threatens to kill her if she doesn't find the heroin by midnight. Meanwhile, a young policeman realizes that his girlfriend, who has left him, is not coming back. He goes to a local bar, and finds himself sitting next to a woman in a blonde wig and glasses. . .

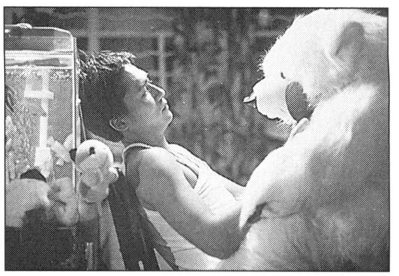

Photo courtesy of Miramax Films

The film's second story echoes the first, focusing on another policeman abandoned by his girlfriend. She leaves his key with the girl who runs the Midnight Express, a fast-food shop where the policeman buys her a chef's salad every night. The girl who accepts the key is attracted to the policeman and uses the key to enter his apartment and make startling changes, hoping he will notice.

Wong Kar-wai began his project with three short stories, "but that made the film too long," he explains, "so I'm saving the third story for another film." The Hong Kong native, who began his career interning at a local TV station, made his feature directorial debut with *As Tears Go By*, in 1988. The film's plot was heavily modeled on Martin Scorsese's *Mean Streets*, but the strong visual style was Kar-wai's own.

Chungking Express was made in two months, shot on a very limited budget, mostly with a handheld camera. "It was like going back to the very basics of filmmaking," says Kar-wai. "The only thing I could fall back on was my creative intuition. Most of the film took place at night, and at times, I felt as if I had become a film student again. By working at such a crazy pace, I felt I had come close to the pulse of this city."

Kar-wai and cinematographer Christopher Doyle, an Australian who lives in Hong Kong, worked without a script, and without any preproduction. "I'd write outlines each day, and we'd shoot them that night," says the director. Doyle's job was both complicated and simplified by the production's inability to spend the time or the money on a lighting package. Everything was shot with existing lights, "and without a permit,"

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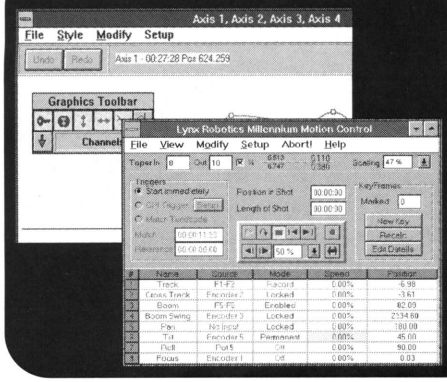

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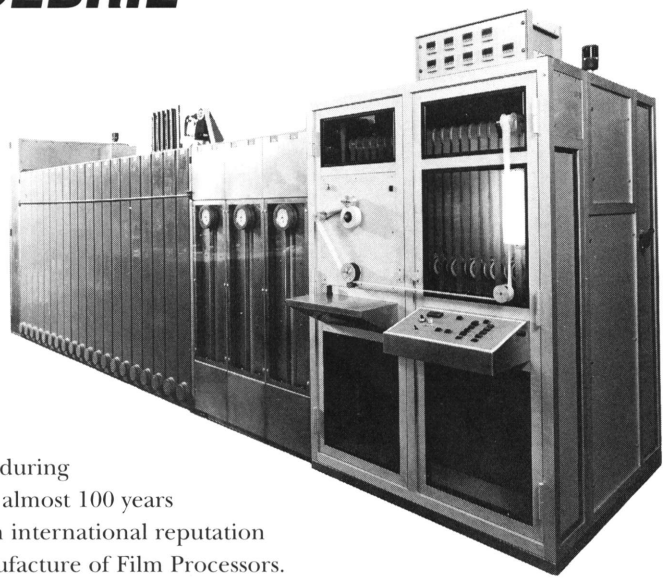

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Kar-wai notes. "Technically, it was illegal to do what we did. We'd look for some good light that fit our needs, rush in and shoot and rush out. Our crew had a nickname: The Thief of Light."

Doyle shot with an Arriflex BL 4, "which was difficult," Kar-wai observes, "because it's a heavy camera to handhold." But the guerrilla tactics with which the film was made — and which kept the filmmakers on alert for authority figures who might shut down their film — was necessary. "It's very hard to shoot in Hong Kong," says Kar-wai. "You need permits, and public buildings don't allow shooting at all. You have to work like thieves." —B.C.

One Night Stand (United States)
Director: Talia Shire
Cinematographer: Arthur Albert

First-time feature director Talia Shire describes her film as "something I'd wanted to do for a long time. Directing was my original impulse all along, because I love visual things. I'd explored dance, choreography and acting. Directing was simply the next step."

Shire says she and her late husband, Jack Schwartzman, who died before the film was completed and co-executive-produced the movie, chose *One Night Stand* "because it was just the right kind of project, where I could have creative freedom while I was still learning. Sculptors work in plaster before marble."

In a move that neatly echoed a memorable moment in her family history, the aspiring director chose Roger Corman to executive-produce her debut. Corman, of course, helped Shire's brother, Francis Ford Coppola, get his start in the 1960s by assigning him to direct the low-budget horror film *Dementia 13*. "Roger is unique," says Shire. "He greenlights you, then he leaves you alone."

One Night Stand came to Shire through her manager. The script, by Marty Cassella, appealed to her immediately. Mickey Sanderson (Ally Sheedy), devastated by a divorce and the death of her mother, has been celibate for some time when she meets a handsome stranger at a club one night. She takes him home, determined not to become involved. But when he disappears the next day, she becomes obsessed with her desire to track him down.

Shire chose cinematographer

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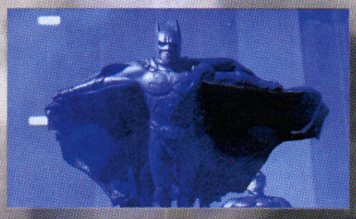

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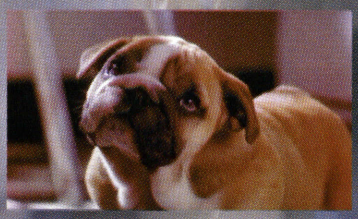

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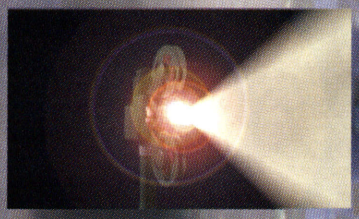

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Arthur Albert to shoot the film, which was staged primarily in Corman's Venice-based studio. "You have to conform to the limits of a studio, but I trusted Arthur," says Shire. "He brought a moment of sensitivity to the actors and knew I was a first-time director. Arthur was a teacher. He let me raise my hand and ask questions."

Blue gels helped give the film's central love scene a beautiful look. "How do you fortify erotic footage?" Shire asks. "We wanted it to have a not-quite-real feeling. It was almost like a ballet, and if you listen carefully [to the soundtrack,] you'll hear a bit of 'Afternoon of a Faun.'" Shire credits Albert and production designer Rusty Smith for helping to achieve the scene's beautiful post-coital afterglow. "We wanted a kind of mystical light, which gave a distinct look."

Even before Shire and Albert began to talk about their approach to the material, the director-to-be consulted with one of the best cameramen in the business: Gordon Willis, ASC. "Gordon told me to remember that conflict drives a movie — light, dark; fast, slow; happy, sad. I was always thinking about that during the shooting and during the editing. And it was very important for me, because the way this story is told, in a certain time and place, it could be claustrophobic. Gordon calls this kind of conflict 'relativity.' And I used the contrasts of light and dark, fast and slow, to drive the curiosity of Ally Sheedy's character."

Because of Shire's close relationship with Sheedy and two of the film's actresses, Nina Hecht and Diane Salinger, the film has a personal meaning for her. The fact that her husband died during the filming makes the project even more poignant for the director. "It was a painful time, and would have been worse if it weren't for the sensitivity of the cast and crew. I felt that the project was an expression of love."

Reflecting upon her experience, Shire remembers another piece of advice Willis gave her. "He said that some of the best films stay with us, because the filmmakers have found a way to make the audience retain key images. I used lighting, poetry and the sense of myth to try to make this movie stick with you. I think that's important. Hopefully, *One Night Stand* will stay in your system for a little while — more than two hours." —B.C.

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Crafting *American Quilt's* Visual Mosaic

Interview by Robert Primes, ASC
Edited by David E. Williams

"There is life after *Schindler's List*," confirmed Janusz Kaminski, ASC while discussing his latest project, *How to Make an American Quilt*, a complex tale composed of different perspectives on marriage, directed by Jocelyn Moorhouse.

Kaminski grew up in Poland and migrated to the United States in 1981 as a political refugee. He arrived in Chicago, and after enrolling in an English language course, moved on to study film at Chicago's Columbia College, where he also served an internship with John Alonzo, ASC on *Nothing in Common*. He completed his education at the American Film Institute in Los Angeles as a cinematography fellow.

Kaminski created the opportunity to shoot his first feature by cold-calling production listings in the *Hollywood Reporter*. He has gone on to shoot 17 consecutive features, beginning with several Roger Corman-produced films, including *The Rain Killer*, and then moving on to bigger-budgeted efforts such as the rap-driven *Cool as Ice* and *The Adventures of Huck Finn*.

After impressing Steven Spielberg with his work on director Diane Keaton's 1991 cable film *Wildflower*, Kaminski shot the Amblin' television production *Class Of '61* and was then offered the opportunity to shoot *Schindler's List*.

One of the most visually and emotionally powerful films ever produced, the picture's beautiful black-and-white cinematography earned Kaminski an Oscar for Best Cinematography and many more accolades, including the Chicago Film Critics Award, the LA Film Critics Award, the British Academy Award and an ASC Award nomination.

Since that time, Kaminski has stretched his technical boundaries with his first anamorphic film, the effects-heavy fantasy *Tall Tale*, and tackled a sports comedy for children, *Little Giants*.

American Cinematographer recently invited Kaminski to discuss his work on *American Quilt* with an esteemed guest interviewer, Robert Primes, ASC. Hailing from San Francisco, where he shot numerous documentaries and commercials before moving to Los Angeles, Primes has lent trend-setting cinematography to the first season of *thirtysomething*, the sci-fi series *Quantum Leap* and the theatrical features *Bird on a Wire* and *The Hard Way*. He earned an ASC Award nomination for the pilot for *Reasonable Doubts*, and garnered this year's Emmy Award for Best Cinematography for his evocative work on *My Antonia*, a period tale of unrequited love.

A young girl (Sara Craddick) watches women quilting from below. Shooting on stages for the interior house scenes, Kaminski deliberately allowed windows and spill to burn out as he tried to replicate the somewhat uncontrolled yet natural feel of a location shoot.

The duo's meeting took place in the newly established Stephen C. Chamberlain Library at the ASC Clubhouse in Hollywood.

Robert Primes, ASC: Would you like to start by describing your interpretation of the film?

Janusz Kaminski, ASC: It's a story about marriage, the consequences of being married, and also the place of women within society. But it's also about men, and is very open about how different men behave. The story is told through the perspective of older women and what they have been through, the experiences of being mothers, wives, mistresses — women who were left by men. But it is reflective without being too depressing. Within the film, a group of women are making a quilt for a younger woman, played by Winona Ryder, who has just been asked to get married. Each woman creates a patch that represents her own life and the love she has had. The quilt itself is metaphoric about how the past, the present and the future will contribute to the way this young woman sees life and marriage — and how she deals with being on the verge of making that very important decision. So the film is composed of their different stories being told to her.

RP: Now, this is a film that really benefits from subtlety. For instance, there's a lovely shallow depth of field you used throughout *American Quilt*. What I particularly noticed was that in the dolly moves, especially those that curve around and move between characters, the focus changes were beautiful. You were doing what I call 'pass-offs,' where within a dialogue scene you do a focus shift on an actor's lines. But with the blocking and the camera moves, they were only noticeable to a trained eye.

JK: The camera operator, Mitch Dubin, and focus-puller, Steve Meizler, who have been with me for awhile now, were great. Mitch is one of these unusual people who is an operator but has also been a cinematographer. But he wasn't thrilled by the process, so he wanted to remain an operator, to be treated with respect and be paid well.

RP: There are career assistants and they are wonderful to work with. I once talked to a very

Photos by Suzanne Tenner, courtesy of Universal City Studios and Amblin

Sophia (Samantha Mathis) confesses her unhappiness as her husband (Loren Dean) packs his bags — with their baby in the background (out of frame). The flashback began poolside with a "candy" brightness, but was reduced to deeper tones as their relationship ebbs. Kaminski notes, "I put a strong front light on her to suggest her openness, while he was manipulative and in shadows. The scene was shot on location during bright day so I put heavy NDs and blue gel on the windows while we used chocolate gels on the lights inside." Kaminski also used a light smoke for some shots — until the inclusion of the infant in the scene required him to use fog filters for health reasons. "The warm light with the blue background made it handsome, but I thought it also was a good artistic interpretation of the material."

fine assistant and asked if he'd rather look through the lens and he responded, 'No, that would be terrible.' He had an image in his mind, whether he was pulling focus, zooming or moving the iris, and he was seeing it in his own way. He loved that space. And that's a rare thing, because in Hollywood, most people are ambitious. If you're shooting, you want to direct; if you're operating, you want to shoot.

JK: I have been asked if I want to direct movies, and I say, 'Why?!' Why do people think that's a natural progression? I am very proud to be a director of photography and there is this misunderstanding that once a cinematographer achieves a certain degree of respect he or she will move on to direct.

RP: How was it working with [director] Jocelyn Moorhouse? How did the blocking go? What was your relationship with her?

JK: She had directed one other movie, *Proof*, in Australia, where she is from. After that, she came here because she had been chosen by Spielberg to direct *American Quilt*. Moorhouse is a very talented novice director, but sometimes she would tend to go too tight with the frame. That was the one thing we would work on together; opening the film up. Sometimes I would put another camera next to the A-camera with a wider frame — just to open the film up, because the environment is such an important part of the movie. And I have to say I failed in that respect, because there are very few wide shots where you can see the landscape. At the same time, maybe I didn't, because the impact of those few shots is very strong. Mitch, Jocelyn and I would block the scenes, but it was difficult because we were working with such a large assembly of women. But Mitch was very good and Jocelyn would come up with great blocking ideas. So it was a good experience for her. But [as a cinematographer,] you can only be as good as the director allows you to be. That's why it was so great to work with Steven Spielberg and Diane Keaton — they are so visual; they're artists. But while I always find it interesting to work with a beginning director, I often also find myself asking why they are given the power to be right when it comes to certain aesthetic and photographic decisions.

RP: I have to agree. In terms of performance and emotions and story, that's one thing. But as for lighting and filtration, there are very few directors who can see and understand how it works the way a director of photography will. There is a lot of common turf though, with blocking and angles and lenses.

JK: Of course there are variations, and the director will have certain ideas, but you are hired because this is your field, and they liked your work. So if they're not too insecure, sometimes I just want them to take the ride and let me take them somewhere they haven't gone and experience new. I have the desire to go places that are new for me and my photography.

RP: I noticed that on some of the older actresses, you allowed all the skin imperfections to show clearly — you didn't use anything to conceal them.

JK: That was something we dealt with early on. I wanted the faces in this film to be realistic. If you have a beautiful 60-year-old

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face, maintain its dignity. Don't emphasize the imperfections, but *find* that beauty. Lois Smith, the actress who plays the older Sophia, has one of the most beautiful faces I've ever photographed. I was crazy for her face. Jean Simmons, Anne Bancroft and Ellen Burstyn, they all have wonderful faces — and to try to make them look unrealistically younger would not have made sense in the film. They are supposed to be older women. It's unfortunate that in our country, our culture, we don't see the beauty in older faces. Old age is treated like it is something shameful — especially in California.

RP: The production design was terrific. You had a lot of beautiful, boldly-colored walls with strong surfaces that integrated very well with the lighting. It looked as if you had a nice collaboration going on there [with production designer Leslie Dilley.]

JK: Leslie is a great designer. All of the interiors and many of the exteriors of the main house, where the quilters work, were shot on stage. So as we walked through the sets as they were being constructed, I would suggest things to Leslie, and he really followed through. But they were standard things: I'd ask for certain kinds of windows or shapes of doors. But to give a more realistic feel on stages, I usually tend to work a bit sloppier. For instance, when there is a practical or window, I want them to burn out. First of all, that helps you because it hides the outside, but it also give the impression that we don't have complete control. If we did, then everything would be perfect and balanced. So you can play certain tricks to give the illusion of reality. But I had never done such large day interiors on stage before. I also took notes on all my lighting and color information, writing them in the pages of the script. Then when I saw dailies, I would immediately write in if I was successful or not. And I learned a lot from that. Sometimes when I'm in a tricky situation, I'll go back through those notes and use them to help me. I know what will work or what won't because I'd done it three weeks or a year before.

RP: How did you choose the different looks for the film's substories?

JK: The very first starts in 1860 and is the story of a young black woman who is led to her future husband in a very magical, metaphorical way — by a crow, which she follows. Of course, our perception of that time is either from black-and-white or daguerreotype photography. You feel the texture, the colors are faded — with very strong sepia tones that tend to be brown or yellow. So that was the direction, and I wanted to re-create what was expected by the audience because I think it's very hard to go against what their perception of the past will be. It's hard for them to grasp the notion of 1860 with a full color spectrum, so automatically you turn to the cliché of using sepia. But I think that works.

RP: Well, there's a sense of photographic reality that we all have. I realized that some of my perception of night came from photos I had seen in my youth in *Life* magazine. Now, to your eye, night isn't grainy, but to my mind, graininess meant 'night' because of the photos I had seen. So sepia is perfectly valid because in our experience, that's how we have seen the late 19th century.

JK: If this were a film that took place entirely in the 1860s, I would vary the tones, of course. But for our little vignette, I kept the look consistent to separate it from the rest of the film. I applied a tobacco filter with a straw filter so I would get a very brown, almost reddish tone. We also shot at the right time of the day, when the sun was just rising, and used a double fog for that softness and sense of the past. But in the entire film, we were dealing with a lot of time periods: the 1860s, the Twenties and Thirties, the Sixties and Seventies, and then the present, so there was a lot of opportunity to experiment with different filters, stocks and lighting approaches. Now, before I start on any film, I go through many, many photo books. I don't pull photos out, but I memorize certain shots and record them somehow. There are also some films I always watch, like *We're No Angels*, which Philippe Rousselot

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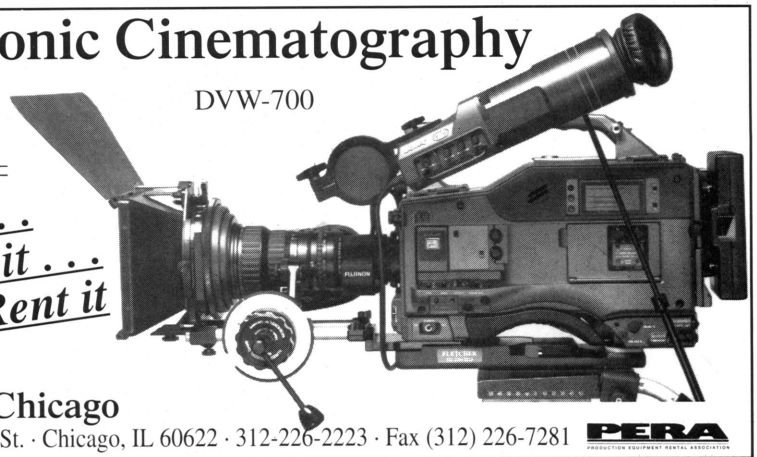

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shot. I love the way that movie looks. But I also remember seeing a cover of an old *Life* magazine, very heavily retouched and Art Deco-looking, of a woman in a bathing cap. That image was so strong that it became the guiding source for another flashback sequence in *American Quilt*, when we meet the young Sophia, played by Samantha Mathis, diving at a pool. You look at that scene and immediately you know it's the 1930s. I wanted the audience to know we were in a flashback from the first frame — there was no confusion about it. I also made a conscious decision to make the first shots of the story a bit sweet, because here we have the scene of a young woman falling in love and beginning her adventure into life. The story of Sophia [and her lover] starts with a great deal of hope, but as their story progresses, we realize how pathetic the marriage becomes for her. The tones change from this candy brightness to an almost blue-green. It's very sad, but at the same time, I was trying not to hit the audience over the head by being sappy with the photography — the material was already sentimental.

RP: But you went in strong with the golds and the filters. It was supposed to be romantic. There's a scene later on during another flashback where you use double gold rims on both characters in a conversation. Now, if you wanted to be realistic, you'd have a single gold rim because it's supposed to be sunlight. But by doing what you did, it immediately felt like something out of the past and was very powerful. That was one of the things I liked; that you were not afraid to be romantic.

JK: But in the sad parts of the story, I didn't want to be over the top with sad lighting and sad images. You start getting away from the actors that way. Let them reflect the sadness of the material. Of course, you shouldn't go against that mood; you must support it. And that's the main goal I had with *How to Make an American Quilt* — to do a story that wasn't too sappy or romantically stylized, but [was instead] dignifying for the actresses. [I tried] to reflect what was hap-

pening in the story instead of creating this big subtext with the photography. The actresses were so amazing, and the writing was so powerful, that I didn't have to add too much.

RP: I have to disagree. You did add a great deal to the story. A lot of it was in texture: the lace curtains, all the dappling at night, lighting through the rain, water reflections. You were always being expressive. But that is the difference from cinematographer to cinematographer. John Bailey, [ASC], for instance, would have lit it more simply, but that's all relative. To me, it felt as though you weren't trying to hold back.

JK: (Laughs) I was holding back with my lights: I didn't want to be obtrusive.

RP: But that use of texture is everywhere and you used it very beautifully. The sequence with the painter and his model in the bathtub, with the diffusion and smoke and red velvet — some of those compositions were memorable. There's also the love scene between the interracial couple at night: this is a very gold film with very little blue, but the unfilled blue rim light coming through in that scene was just right. And for me, a love scene should be discreet; it should have tenderness without being biological.

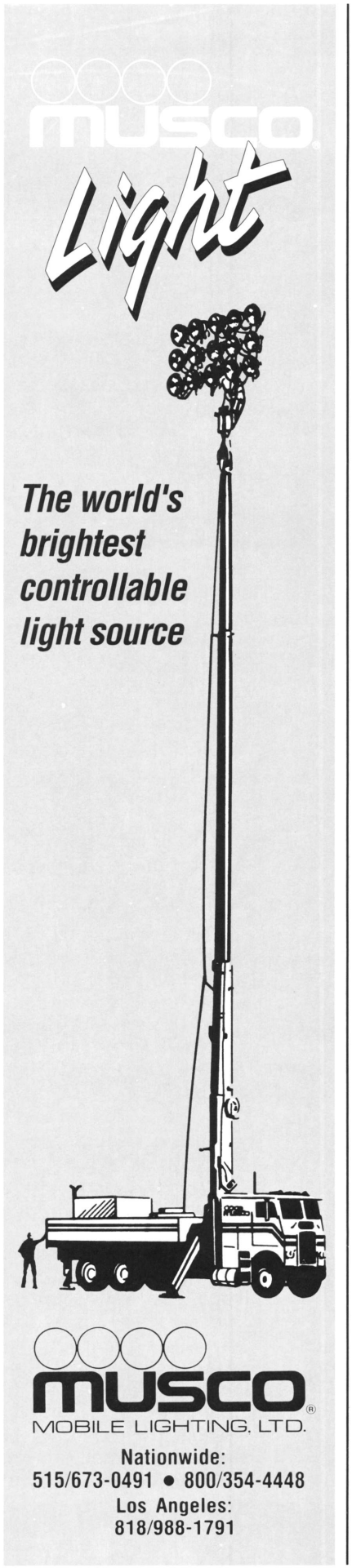
JK: Yes, but always with the blue you have problems with magenta in the faces. Somehow, though, I managed to avoid having too much magenta. At the same time, I wanted to avoid the clichéd night exteriors where you just go blue, so a lot of the nights are lit with warmer light. And with the day exteriors, because I wanted to go softer, I always tried to knock everything down to an f4.5-6 and work with longer lenses — but not too long. 135mm would be a favorable lens for close-ups. You can suggest a certain period or style by only using certain lenses. And because I was using so many warm filters, I would light the fill side with just white light and then the filters on the lens would warm it up and balance the image. My favorite combination was half-coral and straw #2 in addition to an 85. And I discovered the Warm ProMist filters. Each story and period had its own filtration, but I also spent a lot of effort in timing the trailer and the IP. I also flew to Toronto and supervised the release prints there.

RP: You can really lose the look if you're not careful [at the post stage.] You can time the film and have a beautiful direct print, but it still might come back ruined on the internegative. It happened to me on *Bird on a Wire*.

JK: Well, I really wanted this film to be right because of the perception about my work [in regard to] *Schindler's List*. It was like I had to prove to some producers that I could also shoot color as well, which is completely unreasonable. I've done 17 movies in the U.S., but most people only know of two. You can do work for years and suddenly make one film that captures people's attention and they ask, 'Who is this guy?' I started with $500,000 budgets, and have now done $40 million films, but I have been asked, 'Can you shoot color as well?' I have been also asked if I can also shoot music videos or commercials for television or gritty movies. Of course I can! There's no difference. The main thing is to tell a story, but so far as the technical aspect is concerned, you shoot some tests and learn the new approach.

RP: And that's when you might do your best work, when you are challenged to do things in a new way. There's a tendency, a fear factor, that leads to people being hired to do the same thing all the time — and as a result, there's the danger of your work getting tired and dried-out.

JK: I agree, but you still have to keep certain standards. Michael Ballhaus [ASC,] Gordon Willis [ASC,] and Allen Daviau [ASC] all have standards that are so high. I'm just trying to *get there* so I can *stay* with a standard. But I'm tremendously happy with *American Quilt*. There are a couple of close-ups I would want to do again, and I wish it was a bit wider. I wish I was encouraged to take a few more chances — but I didn't for whatever reason. I especially feel that way given that there are so many great films on the screen these days.

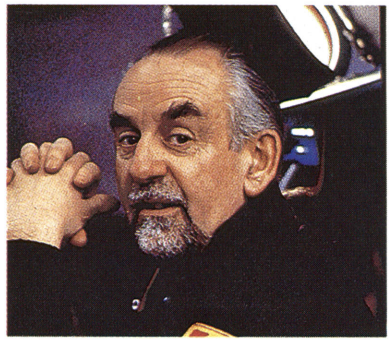


IF IT WAS GOOD FOR ANYTHING, THE Cold War at least offered grist for the high-adventure film mill, resulting in the enduring, influential and entertaining James Bond series — beginning in 1962 with *Dr. No* and last updated in 1989 with *License To Kill*. But while recent developments in geopolitics may have spelled obsolescent doom for the real cold warriors within Her Majesty's Secret Service, novelist Ian Lancaster Fleming's dashing Bond character has found the New World Order chock full of worthy foes to thwart. *GoldenEye*, his 18th adventure, finds the globe-trotting, vodka martini-drinking super-spy (Pierce Brosnan, the fifth actor to take on the coveted role) faced with a high-tech Armageddon, as the titular ex-Soviet military satellite falls into the wrong hands. One blast from its super-destructive electromagnetic pulse weaponry will wipe out a country's electronic infrastructure forever. Neither SMERSH nor SPECTRE is behind this fiendish plot; this time, the covert cabal is the all-too-real Russian Mafia, which is willing to blackmail the world with GoldenEye's ability to zap the Digital Age back to the Stone Age. And little does 007 know, but someone from his past is on their side — the supposedly dead 006 (Sean Bean).

Bond fanatics will also recognize "GoldenEye" as the name of Fleming's beachfront Jamaican home, where he penned the innuendo- and action-filled 007 novels between 1952 and 1964.

Escorting this typically-outlandish premise (scripted by Michael France and Jeffrey Caine) to the screen are New Zealand-born director Martin Campbell and British cinematographer Phil Méheux, BSC. The pair had initially met in the 1976 on *Black Joy*, a feature produced by Campbell which marked Méheux's end as a BBC cameraman and beginning as a freelance cinematographer.

But as Méheux explains, his career in cinematography began much earlier. "I think the first film I saw as a child was *Bambi*," he readily admits. "So I kind of latched on to cinema from that very beginning and it got to the point where my brother and I would go see everything. I was given film books at Christmas which had pictures of cameramen sitting on cranes, and I got more and more interested — principally in the movies coming out of Hollywood. Films like *Scaramouche* and *Singin' in the Rain* were terribly exciting. So I decided to get into making films. *I* wanted to be the guy swooping in on that crane, so I began to follow the careers of cinematographers like Harry Stradling [ASC] and Leon Shamroy [ASC] — noting all their films and which awards they had won. It became a question of figuring out how to get into the business — a question I was somewhat embarrassed to ask."



Turning down further formal education, but armed with moral support from his mother, the 16-year-old Méheux soon found a position with at least a tenuous tie to filmmaking: as a clerk at MGM's distribution branch in London. Leaving after finding that there was no chance to transfer to the company's studio facility, he worked as a projectionist at a TV commercial house, during which time he met others with similar aspirations and began making films on 16mm. "We got very into Russian, Italian and German styles — suddenly we were very cerebral," he laughs. Méheux then applied to a new BBC trainee program for assistant cameramen — only to find it impacted. He was later accepted, and "by luck and adventure" had found his way into his chosen field.

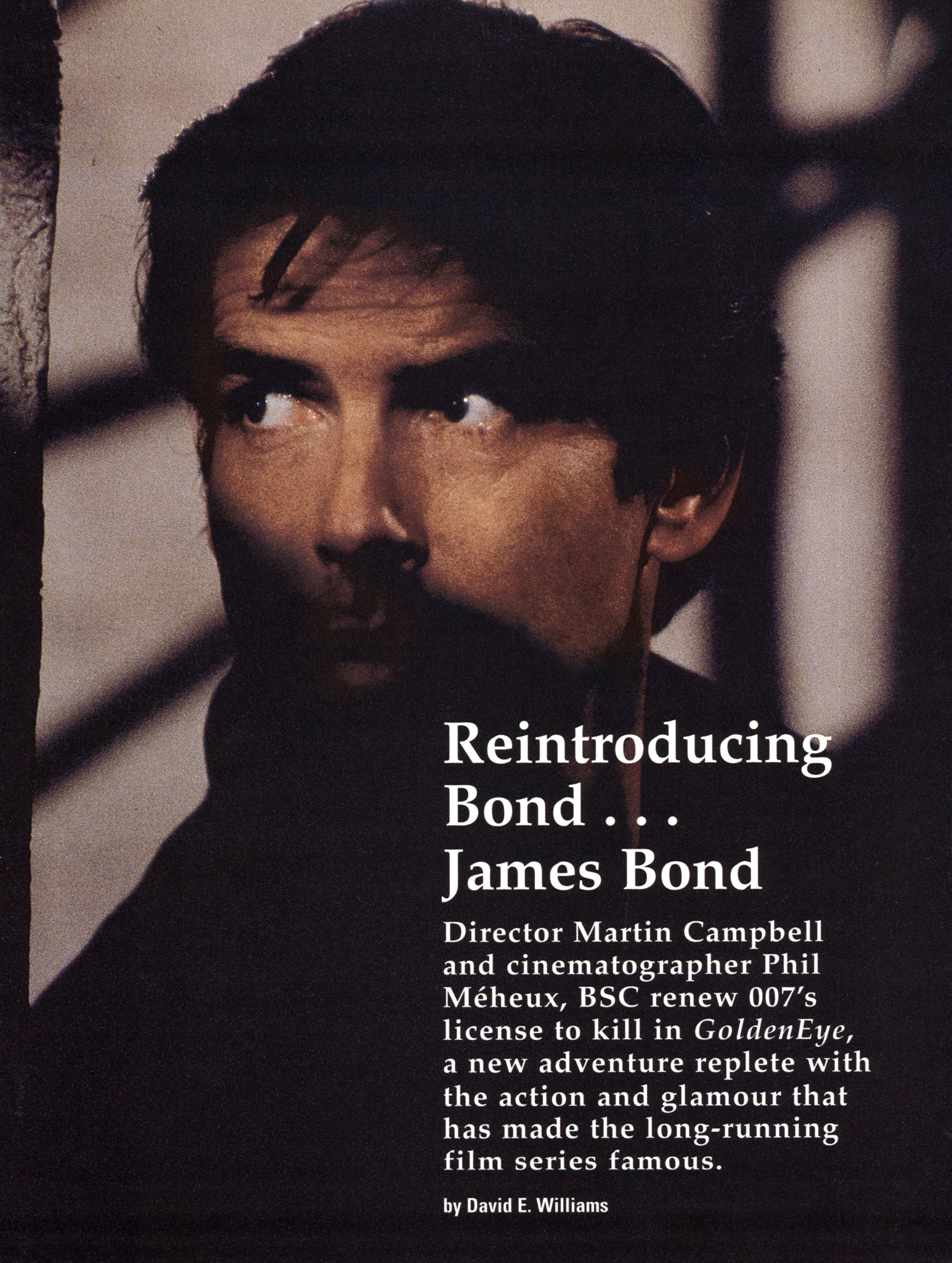
"In those days, the BBC was doing some important things. Ken Russell was a director there, as was John Schlesinger," he notes. "And with the advent of lightweight 16mm cameras, such as the Eclair, it became easy to make dramatic films on location. Although the BBC was originally set up to produce documentaries, directors there saw the advantage to shooting drama on film as opposed to doing it live with a three-camera setup in the studio. So that work started to expand." But due to low budgets, the film crews were required to fill several jobs. And on shows such as *Spy* and *Dixon of Dock Green*, Méheux quickly worked his way up from assistant/focus-puller to cameraman/operator, getting his break as a cinematographer on a pop music documentary featuring Pink Floyd and plenty of psychedelic style.

After a time spent alternating between BBC drama and documentary work, Méheux was approached to shoot his first feature, the aforementioned low-budget 35mm project *Black Joy*. Méheux was convinced to leave the BBC to shoot the film by producer (and future *GoldenEye* director) Martin Campbell — creating the foundation of a long-running friendship. "We got on like a house on fire," enthuses the cinematographer, further explaining that Campbell soon moved into directing for television.

"Having done 12 years of TV by this time, I was ready to move on," Méheux says, "but I told Martin that if he ever had a theatrical feature, I'd be there for him." This would ultimately lead to their

Opposite: *Agent 007 (Pierce Brosnan) melts into the shadows.* Right: *Bond lounges with Russian operative Natalya Simonova (Izabella Scorupco). Eschewing the political correctness that kept Bond relatively dateless in the previous two films,* GoldenEye *retains the series' glamorous sexual tradition. However, director Campbell and cinematographer Méheux (below right) opposed the script's graphic treatment of such scenes and preferred a glowing, golden feel.*

Photos by Keith Hamshere and George Whitear, courtesy of United Artists Pictures Inc.



Reintroducing Bond . . . James Bond

Director Martin Campbell and cinematographer Phil Méheux, BSC renew 007's license to kill in *GoldenEye*, a new adventure replete with the action and glamour that has made the long-running film series famous.

by David E. Williams

Intricately storyboarded by Campbell, the tank chase sequence was principally staged by second-unit director Ian Sharp and cinematographer Harvey Harrison, BSC in the streets of St. Petersburg, Russia. Some city officials were worried that the 42-ton beast would collapse through the streets into the sewer below. Fortunately, it didn't. The chase was finished at the production's base in Leavesden, England.

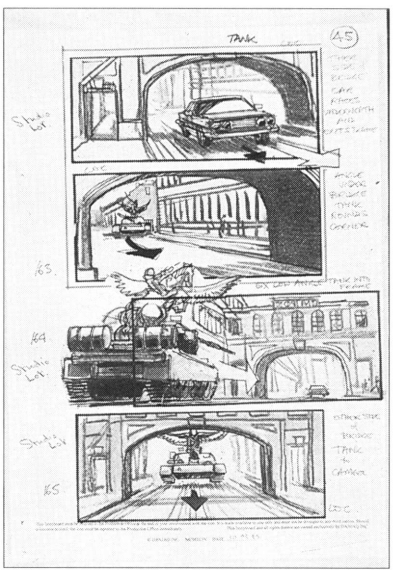
collaboration on the thrillers *Criminal Law* and *Defenseless*, as well as the futuristic actioner *No Escape*.

The director of photography's other credits include *The Music Machine*; *Out*; *Scum* (a controversial youth prison film produced by Campbell); *Those Glory, Glory Days*; *The Long Good Friday*; his first American production, *The Final Conflict (Omen 3)*; *The Final Option*; *Experience Preferred But Not Essential*; *The Honorary Consul*; the sci-fi comedy *Morons From Outer Space;* the independent Channel 4 feature *Max Headroom*, upon which the U.S. series was based; *The Fourth Protocol*; *Renegades*; *Highlander II* and *Ruby*.

Campbell is also known for his work on *Reilly, Ace of Spies* and the series *Edge of Darkness*. Following those projects, Campbell moved on to make his previously-mentioned pictures with Méheux, as well as HBO's supernatural noir film *Cast a Deadly Spell*. The director says, "It's always difficult to know how things like this happen exactly, but MGM/UA then called regarding Bond."

Enter James Bond

"Martin and I were both in Los Angeles and he was a bit perplexed by the offer," says Méheux of the duo's first reaction to being invited on board the *GoldenEye* ex-



press by producers Michael Wilson and Barbara Broccoli (who are, respectively, the stepson and daughter of long-time 007 producer Albert "Cubby" Broccoli). "Martin wasn't sure it was *him*, but he said, 'The Bond films have such a particular feel and style — let's get them out for a look.'"

Jokes Campbell, "I wanted to see just what the hell I was getting into."

"We decided that the earlier ones were much better in several ways," says Méheux. "In the Sean Connery films, Bond's character was much stronger and much more believable as a spy. The set design was revolutionary — they created a world of their own — and Ted Moore [BSC], who shot seven Bond films, achieved a definite visual look. Martin and I didn't want to mess with that too much. It was important to retain the good things about the Bond image while still bringing it up to the Nineties in terms of visual style and look. Because while there is a huge audience out there for Bond, I think there's another one for a newer Bond."

Explains Campbell, "The series has been so incredibly successful and there are a lot of ingredients in those stories that work, though to a lesser degree in the later films. The humor, the Bond character and certainly the glamorous women have a hell of a lot to do with it — in addition to the big action sequences. But also interesting is that you have a hero who has a killer instinct yet is attractive to both women and men. He's the antihero in the bow-tie and dinner jacket.

"Granted, the early films creak like mad, but Sean Connery was so bloody charismatic that there was no getting away from it — which is something I think we brought back with Pierce Brosnan in the role."

Remarks Méheux, "To his credit, Brosnan has done extremely well. He and Martin have tried to bring back the image of a proper spy who knows what he's doing."

Also brought back with *GoldenEye* is the moodier feel of the first Bond films: *Dr. No*, *From Russia With Love* and *Goldfinger*. "They had more *character* in the lighting," Méheux concedes, "although they weren't exactly low-key, principally because the stocks they had — still relatively primitive and new even in the 1960s — were only about 25 or 50 ASA. So they required more light and much lower contrast in the lighting to be safe." Characterizing some of the later entries in the 33-year-old series as too high-key and "flat" for his taste, Méheux turned to his mentors for aesthetic guidance, pointing out how great cinematographers can profoundly affect the emotional content of a film.

He offers, "For instance, the last scene in *The Long Voyage Home*, which Gregg Toland [ASC] basically lit with one brute arc lamp, is a moment of great cinematic artistry — a cloud passes over the ship our main character is standing on, first casting him in silhouette and then in darkness. He has just discovered that all of his friends have died, and the lighting reveals all of his feelings. John Alton is another inspiration for me. Working on so many low-budget films, like *T-Men*, he developed a tremendous ability to light a set with one lamp, which I find very exciting."

Méheux also recalls a famous sequence from *The Killers*, in which a pair of hit-men, seen in silhouette, mow down Burt Lancaster with bursts of machine-gun fire; the muzzle flashes illuminated their faces, courtesy of Woody Bredell, ASC. He holds equal admiration for Alton's technique in a similar shot in *The Big Combo*, which cuts directly to a limp hand dropping a cigarette to the floor. Méheux adds, "It's much more evocative than blood bags bursting out of people's shirts in slow-motion."

Specifically, Méheux says, "Most films seem to have a very natural look today, which I find quite disappointing. There always seems to be soft light coming from one direction or another, with no definite artistic overlay on the film. But it's only of late that this began to happen. A film as recent as *Star Wars*, for instance, still had good lighting, but it just doesn't seem *required* anymore. With our scheduling today, we're in the age of the *setup*. The more setups you get a day, the better, no matter how they look — which leads to this soft, overall lighting that doesn't really make any kind of statement. It doesn't add to the nature of the film, which reduces the importance of the cinematographer's role in the filmmaking process.

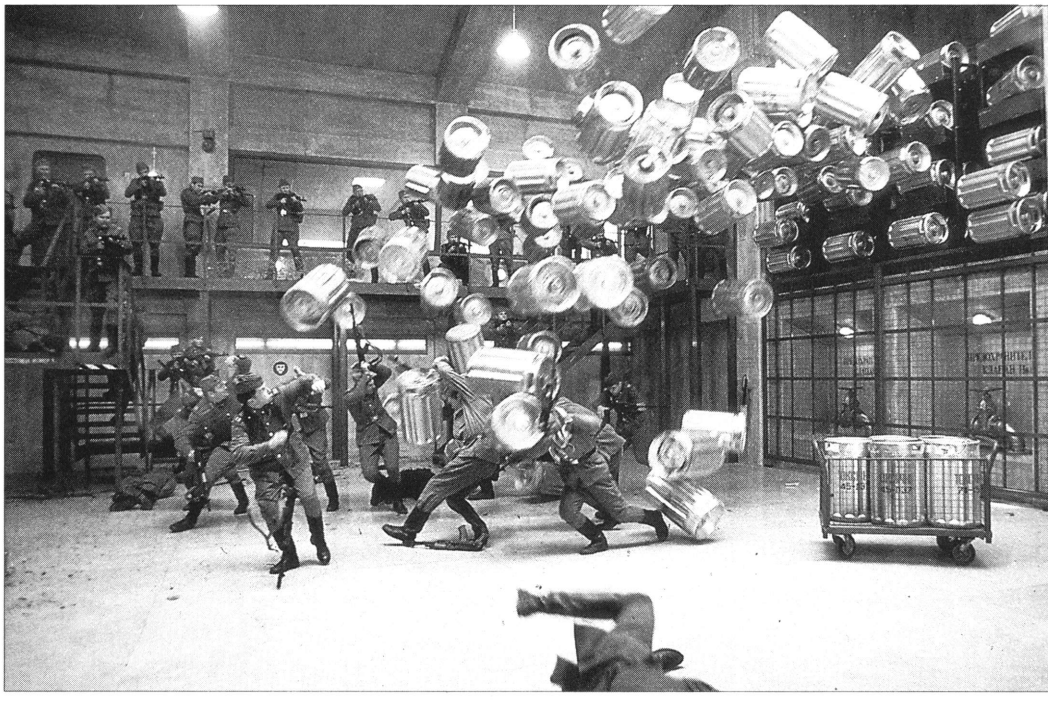
"But good photography is no good without a good director," he adds. "It seems as if certain directors now are coming out of being writers, and they have a lot more interest in the dramatic content than the visual look of their films. It's as if we are just recording what's going on in front of the camera.

"That worries me, though I also think if the dialogue is terrific and the performance great, the camera should be static. It doesn't have to be wobbling or moving left and right for some effect. The important thing is that you're telling a story, and the way you are going about it should be hidden and not visible. So I really feel the best filming work was done 30 or 40 years ago in pictures like *The Third Man*, *Brief Encounter* and *Gone with the Wind* — they were masterpieces. And there are very, very few masterpieces being made today.

"In fact, *GoldenEye* very much resembles *The Third Man* thematically in that the story is also about someone who is not supposed to exist, but who *does* exist. There is a scene in our film that takes place in a sort of cemetery for statues of the old Soviet regime in Russia, and I tried to give it a sort of *Third Man* look — Robert Krasker is a hero of mine. But I suppose that film has been influential on all of my work, in terms of the simplicity of the lighting. I'm constantly remembering lighting effects from black-and-white films. I mean, *Citizen Kane* has probably influenced every filmmaker on the planet, and I can vividly remember every single inch of some sequences."

Relating these influences to his work on *GoldenEye*, he concludes, "We tried to retain the darkness and glamour aspect of the old Bond films — the women always looking good, the men handsome — and the rich opulent settings Bond always finds himself in. But at the same time, we utilized modern camera movement and — I'm almost ashamed to say — more setups to create more excitement for today's audiences."

Regarding the transformation of action editing and pacing in light of such pictures as *True Lies*, Campbell says, "Well, James Cameron is about the best at action, no argument; he's tremendous. What you learn from him though — besides noticing that the action is hopelessly slow in the early Bond films and also the later ones with Roger Moore — is that you really need a terrific stunt coordinator to create scenes that can bear the scrutiny of so many cuts and setups. We had Simon Crane, who also did *Braveheart*. But you also need something *different*. How many car chases have you seen? And how many do you really remember aside from *The French Connection* and *Bullitt*? Both of those chases had terrific focus, making them superb action as opposed to chaotic destruction. Cameron got his difference with the Harrier jets, but we have a sequence that is dif-



Soviet soldiers are toppled in one particularly kinetic escape sequence designed by stunt coordinator Simon Crane.

Above: ***The "secret lair" is a staple of the Bond films. Designed by 007 veteran Peter Lamont (who joined the series with*** **Goldfinger)** ***GoldenEye's cavernous command center occupied an aircraft hanger at Leavesden. The former factory offered the production 1.25 million square feet of interior space.*** **Right:** ***Poised for action with Bond's Aston-Martin and a Ferrari, the speedy BATT camera truck is shown with its hydraulic crane extended. Mounted on board, the versatile Libra II camera rig could be raised from pavement level to 10 feet in seconds.***

ferent too." Cryptically, he declines to describe it, but says the scene "plays into the nature of action in the Nineties. It's faster, fiercer and more relentless, a change that probably started with the first *Terminator* film."

Adds Campbell, "It is a bit daunting to alter the nature of the Bond films because you have to live up to the expectations of an audience. In addition, we had to decide how to revive the series in terms of story — as the last two went a bit downhill. The series was tired, so we had to design our visual approach to help revive it. This is a far moodier film than those from the past, and what Phil has done is very unusual for Bond films — working very dark and gritty in some scenes, but retaining a highly-polished look overall."

One of the early stages in developing the final visual approach to *GoldenEye* was storyboarding. "I did it all myself with the help of an artist," Campbell says. "Not the dialogue scenes, but certainly all of the action and effects sequences. The organizational task of doing a picture like this demands it. And given that our budget [$55 million] was far below what an American production would have, we had to be careful." The boards were later

presented to Méheux for his input. Referring back to the Soviet statue warehouse scene, Campbell says, "That was Phil's. It wasn't storyboarded and he way he lit it was magnificent."

(Semi) Secret Gadgets

Méheux then tackled the fundamentals of achieving their strategy, beginning with his choice of frame. "All the later Bonds have been anamorphic 2.35:1," he says. "It's the *big* screen, and that's what action films are all about."

Campbell backs that notion up, enthusing, "I happen to love anamorphic. It's a pleasure to frame things that way and it's great to see more films being shot that way, although some hardly need to be."

With the format decided, Méheux concentrated on selecting camera gear. The decision to use Panavision was almost as inevitable as the prospect of going widescreen at all, dictated primarily by lens availability — though the fact that every Bond film since *Thunderball* (1965) has been shot with the system may have been a subliminal factor. But before detailing that process, the cinematographer takes up the issue of Panavision's relatively infrequent use on European productions, stating plainly, "It's too expensive relative to the budgets we're working with here. We just don't have the money Hollywood has, so we can't just *spend* to get the best there is. We've had to experiment more with cameras, lenses and film stocks to keep our budgets down. But I chose Panavision for *GoldenEye*, although I have shot three other anamorphic films using a system devised by Joe Dunton & Company, an English firm that makes anamorphic fronts for old Cooke lenses. They're great, but the problem was that they are all BNC mounts. It's difficult to find a modern camera that will take the lenses — Panavision surely won't — though now that's been corrected with the Moviecam."

Méheux notes that he had previously used Panavision on *The Final Conflict (Omen 3)*, an experience that put him off because he had difficulty finding lenses with matching quality. "After that, I tested all sorts of anamorphic systems — Technovision and others — and I finally found Joe Dunton's lenses and thought they were terrific. I was quite keen to use them again, but there are only three sets. So we turned to Panavision. They gave us the lens availability we needed to supply five units, three shooting continuously. We cleaned out the rental house. The first and second units had two sets of primes each — so we had a total of eight sets in use. Panavision was simply the only company where I could find the

continuity in lens quality that we needed.

"There were only two sets of Primos available to us, one each for first and second units, and one Primo zoom. The model and second units were using Es and I also had Cs, because they were much smaller and I could use them for handheld, Steadicam and cramped spaces."

Méheux's first unit utilized a Platinum Panavision and had a GII as a back-up, while the key lens for the shoot was a 40mm, which he qualifies as a "good wide angle that doesn't distort — which draws the audience into the picture by giving them more to look at." He further reasons, "It's a shame that most films rely so much on tight close-ups all the time, filling the screen with an actor's head like you might for television when there is so much more you can show. The style is really just a result of what producers want for video release. But you just don't need a tight close-up when you have a screen that's 60 feet wide."

Méheux kept his stop at about f4, reasoning that shooting further open invites problems. "You're only enhancing the qualitative differences between lenses by stretching them to their limits. Besides, if you have a 60-foot-wide screen, why just have an eyelash in focus?" Helping out here was Kodak's 500 ASA 5298, which easily gave him that stop without his having to use "acres of light" or resort to "burning holes in actors' faces." Méheux observes that 98's grain is nearly imperceptible and the advantage in speed outweighs any disadvantages. Kodak's 200 ASA 5293 was employed for most exteriors. As Méheux notes, "The sun may shine a hell of a lot in California, but it doesn't in England, especially between January and May." So 93 covered the bases, as Méheux "wanted a stock that could be used all day long." He adds with a laugh, "When we get a cloudy day in Britain, it might as well be night."

On location in Puerto Rico, the filmmakers used 50 ASA 5245. "It *was* sunny," he says. As for speed ratings, Méheux explains that he underrates 98 to 400 ASA at night, or even lower, as "there's

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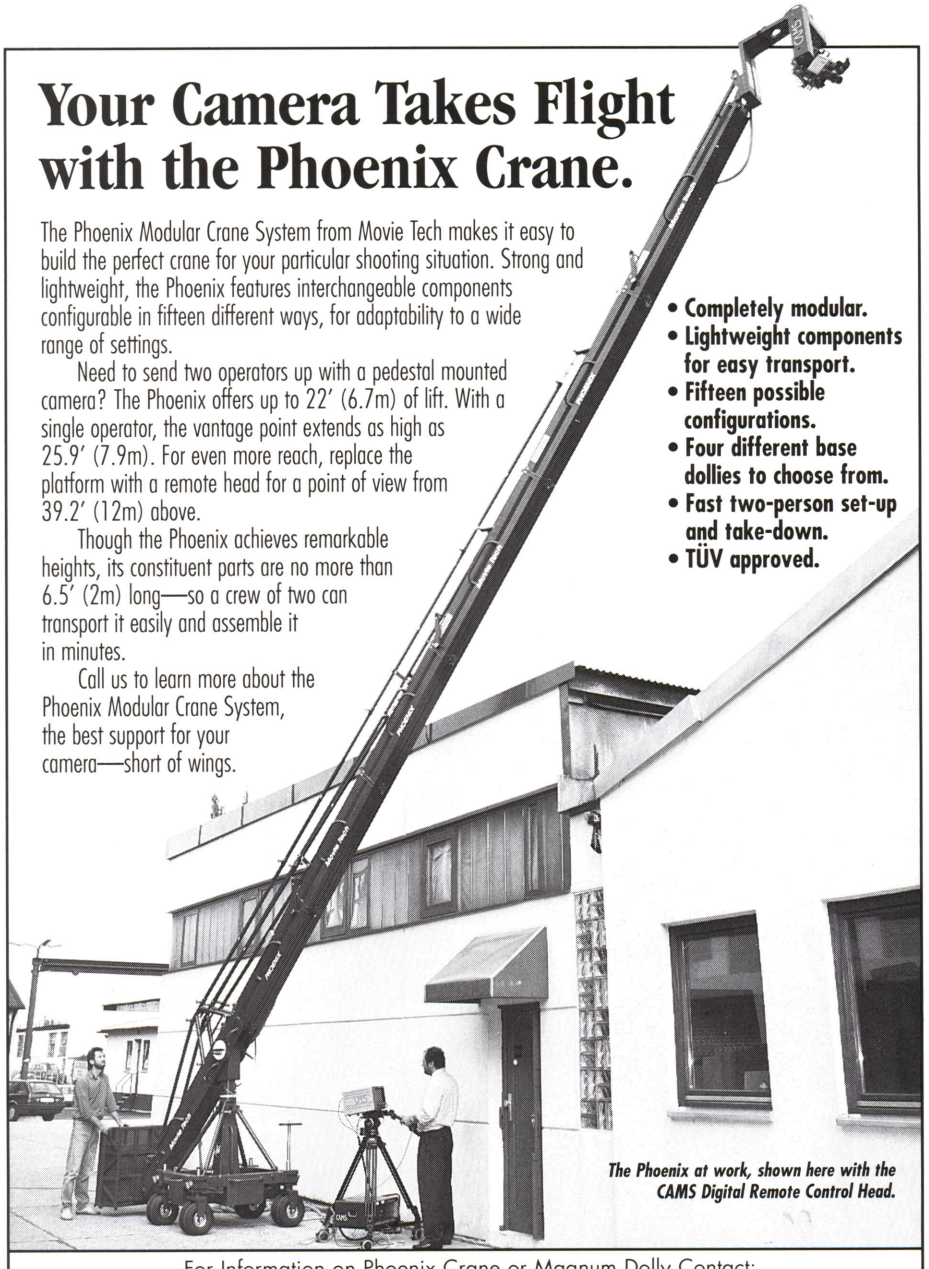

The Phoenix at work, shown here with the CAMS Digital Remote Control Head.

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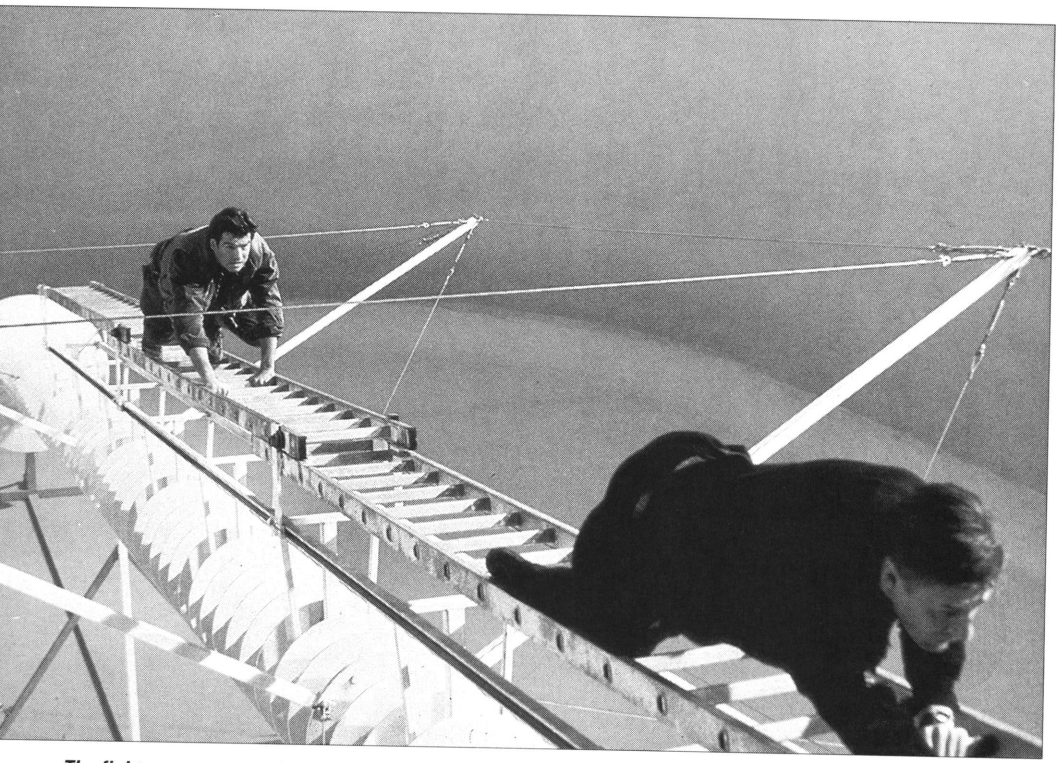
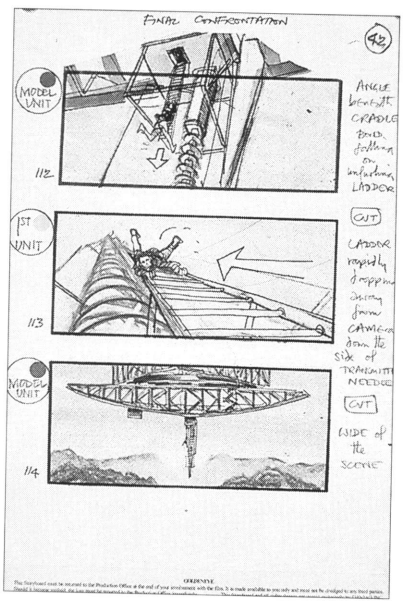


The fight scene finalé between 007 and 006 (Sean Bean) takes place 500 feet above the Arecibo radio dish on its antenna. Due to safety reasons and lack of access to the actual location, Méheux filmed portions of the sequence in greenscreen, to be composited with plates shot on 5245 in Puerto Rico and intercut with stunt and miniature work. Careful planning and communication between camera units ensured success.

nothing worse that a night sequence where there aren't any blacks. But you have to adjust to prevailing conditions." Not incidentally, he mentions that he uses the lab to help him make rating evaluations, saying, "I like my printer lights to be in a certain position and I ask them to tell me if I start wandering."

Remembering the Primo zoom in his lens arsenal, Méheux guesses it was employed "maybe twice over 126 days of filming. To use a zoom in anamorphic, you really do need about four times more light than you would for a prime. So unless you need it for a reason, it's not practical, especially on interiors where you would have to bump your light up a hell of a lot.

"But zooming to me is usually just sloppy operating. There should be a way of designing any shot with camera movement and blocking to achieve the framing you want without zooming. Martin agrees with that, and we were wondering if we would need it at all. Oddly though, I used the zoom because it focused closer than the fixed Primo lenses. I told the guys at Panavision that it's the one problem with the primes — they don't focus close enough. One of Martin's dramatic devices is to start wide and then go thundering



in to end up on somebody's face in tight close-up. So this focal distance issue became somewhat of a problem with the fixed lenses because we would end up just a bit too far away, focused at three and a half feet. But we found, at least on one lens, that the focus deteriorated when on its limit. With the 5:1 Super Panazoom — which is actually a Cooke T4.5 lens — we could get the focus right on these tracking shots, at two and a half feet."

Asked if this focus question was also a issue with the Steadicam work on *GoldenEye*, Méheux takes a breath before opining, "I'm probably going to upset a lot of operators, but the Steadicam is a tool that needs to be used on very rare occasions, although now people have the notion that it can be used to speed up the setting-up process. But if you have a good crew — and I've had plenty of them in Los Angeles, London and Australia — it doesn't take two minutes to lay tracks and get a dolly shot done right. What I don't like about Steadicam is that you can't lock the frame off. You never get the composition that you really want because there are the two or three seconds there when the operator adjusts to having stopped after a move. So he's floating very slightly and if he's two inches off his mark, there's nothing you can do about it. Your shot is now off, whereas if you're on a dolly and track, you know exactly where you are and where you're going. I like the formality of fixed-lens shooting. And while it may sound old-fashioned, I like the formality of saying, 'What is the right lens for the shot and where do we position people in the frame?'"

As a result of this philosophy, the Steadicam was rarely used on *GoldenEye*. But Méheux concedes, "The Steadicam is great if you want to track forever; it's the only way to do the shot. Take *GoodFellas* or *Bonfire of the Vanities* for example. The famous shots in those films were terrific and could only be done with a Steadicam."

Was the notion of shooting Super 35 ever considered? Sparked, Méheux insists, "Anamorphic is far superior, and to me, Super 35 never looks right. People point out *Terminator 2* and *The Abyss* and that James Cameron is a big supporter of it, but he's also the only one. Maybe he has tremendous control over his prints, because when anybody else tries it, the result looks terrible when it gets to the release print stage. The rushes look terrific, but you ultimately get this grainy print with no blacks in it. But there is an elegance to an anamorphic film, principally because you're using a longer lens to shoot a wide image. Your standard lens is a 75mm instead of a 35mm; it gives you a much more

elegant framing." Pondering the intangible, he says, "I just get a feeling from anamorphic cinematography and I remember the images more clearly. Super 35 looks like the top and bottom have been cut off, whereas in anamorphic the frame has been widened.

"Of course, there is always the fact that in Super 35 you will never see a straight print off the negative. Ever. It's always an optical. At least I know that at the world premiere of *GoldenEye* with Prince Charles there, we're going to have an original negative print and it will be as sharp and as grain-free as we can get it."

As for filtration, Méheux debunks the notion that Primos are too sharp to be used without diffusion. "If the picture is too sharp, either the make-up is not right, the lighting is not right or the size of the shot is not right," he says. "Lighting your actors is based on what their character is supposed to be and where they are. And if you can't light right, you put a filter over it all to distract the eye. Besides, you have to remember that any effect is only going to be magnified by the time it gets to the release-print stage, and if the picture is fuzzy, the grain stands out."

Is Campbell a highly technical director regarding cinematography? "No, he's not," Méheux says. "Martin instead submerses himself in the layout, the cutting and the setups. He doesn't know about lighting or how the photography looks until he sees it the next morning in dailies. He leaves that all up to me. He's much more into how cuts work. Unlike many directors today, though, he shoots what he needs, as opposed to shooting every possible angle and fitting it together in the editing room. That may be difficult for a producer who wants to get his hands on things later, but it saves time in the shooting because we know where we're going. But that's what I like about Martin — he's very well prepared. So that makes for a smoother, faster shoot as we don't have to dither around thinking about what we're doing."

Suggests Campbell, "That's my background in television — you just have to be prepared. You learn to always shoot in the direction of the light, plan your shots, rehearse and then make the system work. And we got that down to a fairly sophisticated stage in *GoldenEye*. We never got trapped by bad organization."

Special Ops

Maintaining visual consistency while juggling five units shooting around the globe can be tricky. Says Campbell, "Fortunately, we had good people, although sometimes it became an issue of sitting down and saying 'Well, where the hell are the storyboards?'"

Méheux elaborates, "Certainly the model unit's job was very well defined, but the second unit's work was more of a problem because we were following their lead on several scenes."

A case in point was *GoldenEye*'s tank chase sequence, during which 007 hijacks a Russian T-72 main battle tank and pursues his quarry through St. Petersburg — destroying plenty of things along the way. The sequence was staged by second-unit director Ian Sharp and photographed by Harvey Harrison, BSC, first on location in St. Petersburg and then on sets built in England. "I knew Harvey quite well personally, and he knows what I like to see," Méheux says. "So I would just shoot matching close-ups later to match their footage.

"The usual problem with second unit is that most good cameramen don't want to do it. But while talking it over with Ian, Harvey's name came up. I didn't think he'd do it, but I rang him up and asked, 'So tell me Harvey, are you too famous to do second unit on *GoldenEye*?'"

Though he had wanted to become a farmer as a youth, Harrison was seemingly fated to work in the film industry. As he explains, "My great uncle was William Friese-Greene, who some believe invented the movie camera; my grandfather was a scientist, a pioneer in color film here in Britain; and my father was a director and cinematographer who spent the World War II years making RAF training films to teach pilots how to fly Spitfires. He continued making documentaries and films

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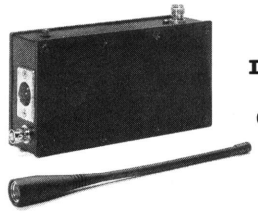

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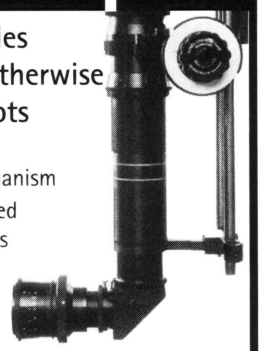

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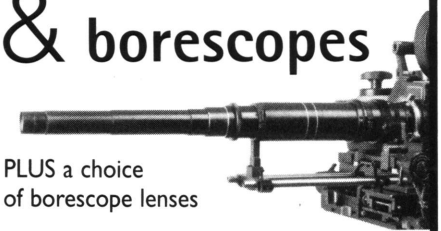

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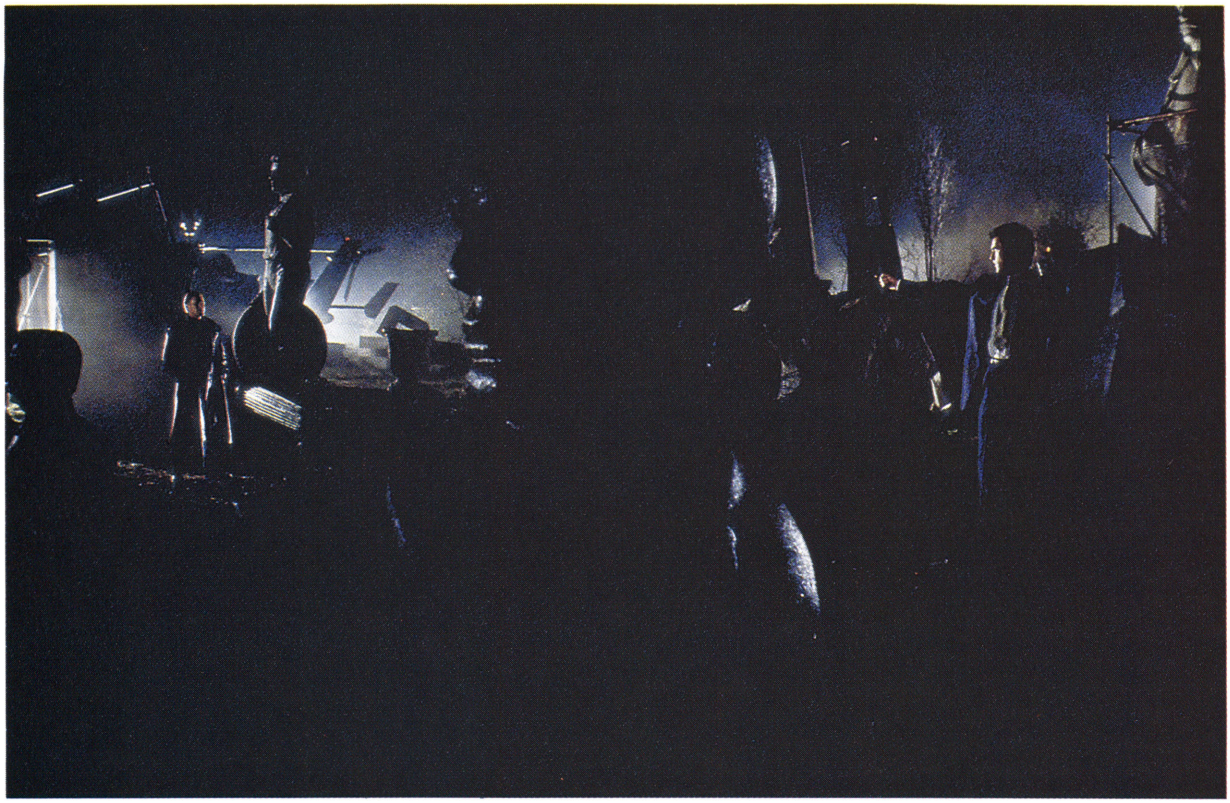

***Inspired by John Alton, Gregg Toland, and Robert Krasker, Méheux constructed this evocatively shadowy and dangerously dark encounter between 006 and Bond at a warehouse storing statues of old Soviet leaders. He cites* The Third Man *as one direct model for* GoldenEye.**

afterwards. So at 17, I asked my father if I could become a cameraman." The answer surprised Harrison, who suddenly found himself thrown out of the house and told to find a job on his own. After a few weeks, he landed his first as a tea-boy at a TV commercial studio. "But I was very lucky, as all of these great cinematographers were working there, like Geoff Unsworth and Nicholas Roeg; I ultimately shot three films for [Roeg] after he began directing. So it was a fortuitous start." Harrison's credits include Roeg's segment in the vignette film *Aria*, as well as *The Witches;* he has also shot *Salome's Last Dance* for Ken Russell and a multitude of commercials.

A former president of the BSC and current president of IMAGO, the European Federation of Cinematographers, Harrison recalls Méheux's initial inquiry and laughs, "He thought maybe I was too high and mighty to shoot second unit, but I quickly dispelled that notion. I'm just a working cameraman like the rest of them. So I was delighted and honored to be asked. But this wasn't so much like mopping up after the first unit. We had real sequences to get our teeth into, and that's what attracted me."

The tank chase was by far the most difficult. "It was five weeks' work and ultimately will last five minutes in the final cut," Harrison says. "We nicknamed the tank 'Metal Mickey' — at 42 tons, it didn't stop for anybody. We had ten days in St. Petersburg and then shot for the balance at our stages in Leavesden.

"The sequence was completely pre-planned by Martin, Ian, stunt coordinator Simon Crane, Phil and myself," Harrison details. "That alone took several weeks before the picture started, because there was a lot of stuff we could only do once, like knocking down various buildings and flattening cars. So on any major stunts we did with the tank, we used a minimum of four cameras, and on one occasion six. Our main cameras were a Panaflex Gold, two Arri IIIs, and one Arri IIIC. We had them all the time, with a full set of Primo primes, 10:1 and 5:1 zooms and some long 400mm and 600mm anamorphic lenses."

Harrison notes that the tank was shot at various frame rates to give it the illusion of additional acceleration and maneuverability. "The first unit then came in and shot inserts of Pierce Brosnan in the driver's seat, changing a few gears and making a few faces," Harrison adds. "I've shot several times in St. Petersburg, and it's a wonderful city. We had a couple of problems getting permission to do certain things, but remember, we were driving a tank at full speed down main city streets. Try doing that in New York or down Sunset Boulevard."

Preparing for the unpredictable weather in England, where the rest of the sequence would be shot, Harrison was careful to "shoot bits in sun and bits in dull weather just so there was a chance it would match what I might get later." Taking careful notes on atmospherics and sun position would also pay off. "We were lucky with the weather, although we did have to bring out two 18K HMIs, two 16K HMIs and a bunch of 10Ks for adding sunlight back home."

According to Campbell, though, "St. Petersburg was a pretty dull place. Harvey was lucky to find any sunlight at all. But fortunately, England is also very dull for the most part, so the matching wasn't too much of a problem."

New Headquarters

While Pinewood Studios has traditionally been the home of the Bond productions, *GoldenEye* couldn't find enough space at the facility to suit its schedule — even though the production company owns Pinewood's legendary "007 Stage," which was originally built in 1976 for *The Spy Who Loved Me*. But the filmmakers found a new home outside of London in the town of Leavesden: a converted industrial complex with 1.25 million square feet of available interiors. "It was a Rolls-Royce aircraft engine factory," says Méheux, "which had been there since World War II and was built on the edge of a runway. After looking at studios in other countries, we settled there. It had plenty of space, and we really wanted to shoot in England."

Four months before shooting would begin, Méheux and his gaffer were summoned to Leavesden to give their recommendations on how the sprawling array of buildings and open space could be best used. Five stages were sound-proofed and fitted with lighting scaffolding, a separate model stage was built and portions of existing structures were minimally made over to portray a Russian military barracks. Since *GoldenEye* wrapped, the Leavesden site has been purchased and will possibly become a permanent shooting facility.

"You can't really call it a studio," says Harrison, "but it is an amazing situation there, with 260 acres of land and a great collection of buildings. And they transformed it quite well, though it doesn't quite have the height you might ask for. I really believe it will catch on."

Recalls Méheux, "Another case where communication became critical for all of us was for a fight scene at the end of the film [between Bond and 006], which takes place at the huge radio dish antenna in Arecibo, Puerto Rico. It happens on the hanging portion 500 feet above the 1000-foot-wide dish, and on the dish itself. We weren't allowed to shoot on the dish, and could only have access on Sundays; there were a *lot* of restrictions. The second unit did wide shots with doubles and shot plates,

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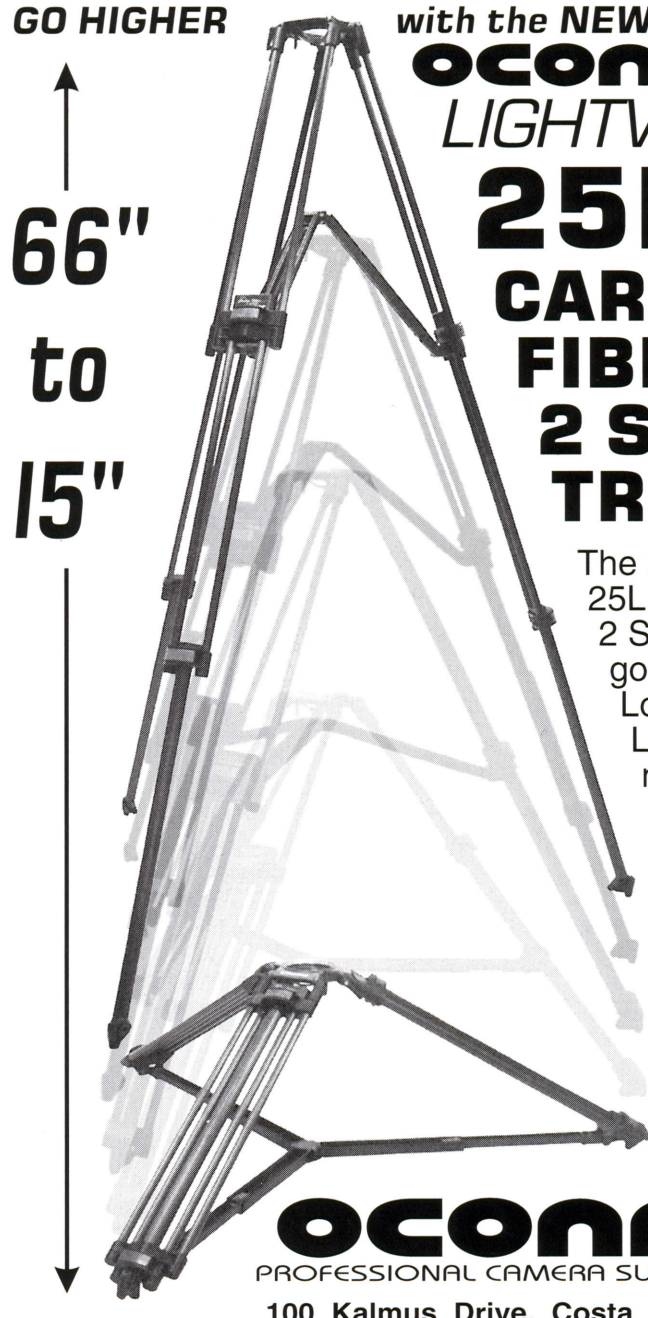

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Disliking the "flat" high-key lighting that crept into the Bond series as it became more comedic in the 1970s, Méheux and Campbell looked back to the work of cinematographer Ted Moore, BSC, who shot most of the early 007 adventures.

and Derek Meddings' model unit built a superb miniature for certain shots which were terrifically photographed by Paul Wilson [see additional story on the film's effects]. We did the main part of the fight on a greenscreen stage."

Studying Campbell's storyboards, Méheux devised sketches detailing sunlight direction and basically "broke it down shot by shot." He placed particular emphasis on lighting schemes for the first unit's stage work, as that's where the bulk of the fight would be shot.

Méheux says, "The green screen was lit with conventional tungsten light, then we had a separate crew shoot a number of tests to see how 'badly' we could light it before the greenscreen broke up on the computer. This helped me know how much I should worry about it and when I could leave it alone, Logistically, the nine-ton antenna set had to be rigged at four different angles to allow for the action to work and we didn't want to have re-light the green backings each time."

Harrison reports that 5245 was used for both the second-unit footage and plates.

Shot in Monte Carlo was a chase between a Ferrari and Bond's traditional car of choice, a custom Aston-Martin DB-5. Says Harrison of the camera chase vehicle, "We used a completely new system based on a Land Rover four-wheel drive truck." Constructed by Barbour All-Terrain Tracking in Surrey and dubbed the BATT, the high-performance rig boasts a 4.2 liter Rover V8 and is capable of on-road speeds of up to 100mph — with 10 speeds forward and two in reverse. In addition, the BATT's suspension has been heavily modified to reduce vibration and features an adjustable shock absorber system. The BATT was first used for battle sequences in *Braveheart* and "it could out-accelerate both the DB-5 and the Ferrari," Harrison says. "But what's really terrific is this hydraulic lift that can be mounted on the back or sides; you can put the camera from nine inches above the road to 10 feet high in just three seconds. We used that together with a three-axis stabilized mount called the Libra II."

Built by the Shepperton Studios-based company Megamount, the joystick-controlled Libra II can pan or roll through 350 degrees and tilt 25 degrees either side of horizontal. It was also recently put through its paces on *Braveheart* and the upcoming Ridley Scott film *White Squall*. Continues Harrison, "You put an Arri III in there with a 5:1 zoom, and you can go over any kind of ground with complete stability. We got some remarkable footage for that chase, and we used the Libra to good effect on the tank sequence as well."

The BATT/Libra II rig also diminished the need for a Steadicam on the second unit's shoot, "though we did do a single POV shot with one," Harrison recalls. "But all of the second-unit work was very carefully done, as Phil and I agreed that the quality of the film should be in every shot. I remember there was an insert we needed of these keys that activate the GoldenEye satellite. Phil just said, 'Make it look like a commercial spot.' So we went for this glamorous, 'Bond' look and it really pays off in the final production."

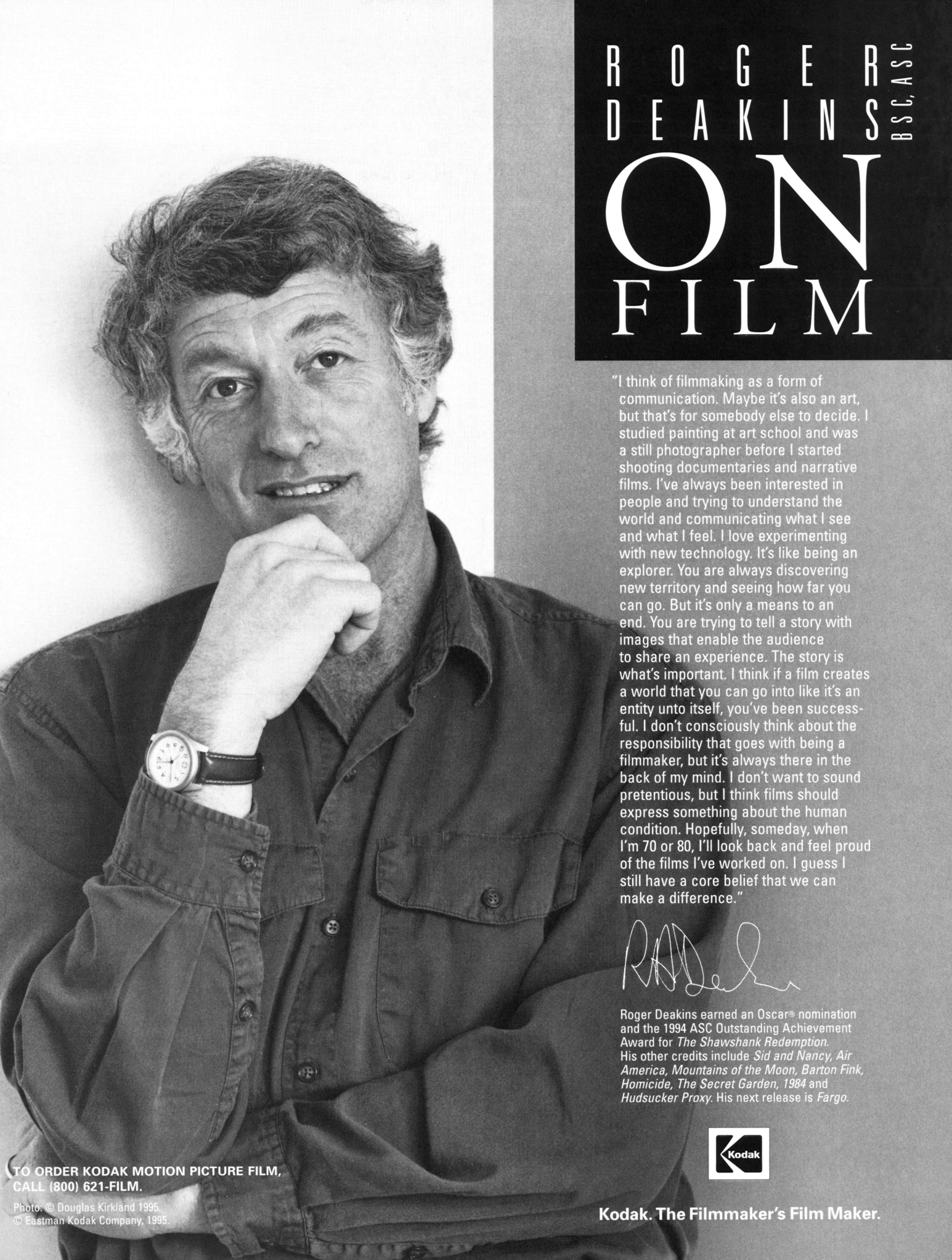
Not incidentally, another chase was staged in Puerto Rico between 007's new BMW and a Cessna light aircraft. Méheux reports that the film's British crew was "terribly ashamed of" the agent's new wheels.

Mission Accomplished

Looking back, Méheux says, "There's been a long gap between this picture and the last Bond film, and during that time a lot of films have used the Bond style. The problem now is the impression that *GoldenEye* has to 'beat' these other films. But I think we've something rather unique here."

Adds Harrison, "They've really upped the ante, and Bond will have a tough time keeping up. But we've made a bloody good try with *GoldenEye*. The action really goes and the character has the British coolness. He's not a superhero like Bruce Willis is in *Die Hard*, or Schwarzenegger in *True Lies*. Bond has to be more realistic, even though he's also something out of our wildest dreams."

But is actually making a Bond film a dream come true? "I hate to say it," confesses Campbell, after finally reaching the end of *GoldenEye*'s production after 18 months, "but it's been a grind. A bloody nightmare. But we're all proud, and above all, Brosnan is the perfect Bond." Pausing, he jokes, "Even though he's Irish!"


ROGER DEAKINS BSC, ASC
ON FILM
"I think of filmmaking as a form of communication. Maybe it's also an art, but that's for somebody else to decide. I studied painting at art school and was a still photographer before I started shooting documentaries and narrative films. I've always been interested in people and trying to understand the world and communicating what I see and what I feel. I love experimenting with new technology. It's like being an explorer. You are always discovering new territory and seeing how far you can go. But it's only a means to an end. You are trying to tell a story with images that enable the audience to share an experience. The story is what's important. I think if a film creates a world that you can go into like it's an entity unto itself, you've been successful. I don't consciously think about the responsibility that goes with being a filmmaker, but it's always there in the back of my mind. I don't want to sound pretentious, but I think films should express something about the human condition. Hopefully, someday, when I'm 70 or 80, I'll look back and feel proud of the films I've worked on. I guess I still have a core belief that we can make a difference."
Roger Deakins earned an Oscar® nomination and the 1994 ASC Outstanding Achievement Award for *The Shawshank Redemption.* His other credits include *Sid and Nancy, Air America, Mountains of the Moon, Barton Fink, Homicide, The Secret Garden, 1984* and *Hudsucker Proxy.* His next release is *Fargo.*
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DEREK MEDDINGS, THE GREAT EFfects wizard whose work has graced every James Bond film since *Live and Let Die*, called his work on *GoldenEye* the most challenging and spectacular of his career. Sadly, he never saw those shots in the context of the finished film: just weeks after *GoldenEye* wrapped principal photography, Meddings died unexpectedly. He was 63.

For 30 years, Meddings' name on both big and small screens delighted audiences around the world. Despite having won an Oscar for his work on *Superman* (1978) — which Meddings shared with his mentor, Les Bowie, whom he revered as "the daddy of British special effects" — Meddings was shy and self-effacing, often poohpoohing his finest work. He hooked up with producer Gerry Anderson in the early Sixties to assist Bowie with effects for the British TV series *Torchy* and *Four Feather Falls*. By the time Meddings lent his skills to such Supermarionation epics as the *Thunderbirds* and *Fireball XL5* television series and two spinoff films (*Thunderbirds Are Go!* and *Thunderbird Six*), he had certainly become one of the finest purveyors of in-camera effects in the business. His work has appeared in hundreds of films and TV shows; from *The Trollenburg Terror* (U.S. title, *The Crawling Eye*) to the classic Technicolor horrors of Hammer Films, from the James Bond series to Tim Burton's *Batman* and beyond, Meddings proved that a fine eye, a great miniature and some clever cheating could create some of the most beautiful and believable effects imaginable. And despite the ever-growing threat of digital technology, he proudly fought for and achieved his finest in-camera effects work for *GoldenEye*.

But with so much riding on *GoldenEye* — literally, the future of the James Bond franchise — there was tremendous fear that the latest film in the longest running series in cinema history wouldn't measure up against challengers to the throne, such as James Cameron's Bond homage, *True Lies*. Meddings was determined to surpass the Oscar-nominated work created by Digital Domain's host of effects artists, even though his team numbered just 20. *GoldenEye*'s director, Martin Campbell, was skeptical about Meddings' desire to create state-of-the-art effects without using computer-generated imagery. "Nowadays, unfortunately, people have got this thing in their heads that if they don't have access to a computer, they can't make films anymore," Meddings lamented in an interview on the *GoldenEye* set just months before his untimely death. "It's driving me crazy! A computer should only be looked at as another instrument, not thought of as the ultimate gadget to solve all your effects problems. We've been making films here and in America for years without computers, and they've looked fantastic."

GoldenEye: Epic Effects on a Small Scale

James Bond's latest adventure serves as a swan song for the late Derek Meddings, the British master of miniature work.

by Ron Magid, with additional reporting by Ed Gross

Because of budget restraints and tradition, Meddings was given the go-ahead to plan and execute *GoldenEye*'s effects — but the spectacular results made a believer out of Campbell. "This is my sixth Bond film, so I don't have to sell myself to the producers, but at the beginning, I did have to sell myself to the director," Meddings wryly recalled. "Martin hadn't used very many miniatures before and he had grave doubts as to whether certain things could be done effectively. Once he saw the first few weeks of shots we'd done, he was so excited that I no longer had to convince him; instead, he would look at me and say, 'I know you can do that as a miniature!' Consequently, I've had more miniatures on this Bond than on any film! That's what I enjoy doing."

Meddings was ably assisted on *GoldenEye* by his eldest sons — Mark, the film's senior effects technician, and Elliot, an assistant director on the model unit — and by his longtime collaborator, modelmaker Brian Smithies. Smithies started on the *Thunderbirds* series fresh out of art college, and built models for Les Bowie and Meddings for many

A Russian MIG-29 Fulcrum takes an inverted dive into a top-secret Siberian radar installation, courtesy of Meddings' brilliant miniature work and photography by Paul Wilson, BSC.

Photos by George Whitear, courtesy of United Artists Pictures Inc.

The 1/7-scale radar dish was detonated with multiple charges as the aircraft impacted — shot at 120 fps with a Panastar camera.

years. After *Superman,* Smithies parted company with the duo to pursue a career as a visual effects supervisor in his own right. After helming such impressive projects as *Dracula* (the Frank Langella version) and *Dune,* Smithies returned to the fold to work with his mentor on *GoldenEye*. "Derek was, as far as I'm concerned, the ultimate master," Smithies says softly. "Like Les Bowie, he was wonderful, superb, an artist, and he was in the same school. The amount of experience he had added such a depth to his work that's lacking in a lot of others'. My willingness to go back to work with Derek was based on my admiration of his skills. That's where the closeness of our relationship grew — this sort of mutual respect. I must say I learned an awful lot from him."

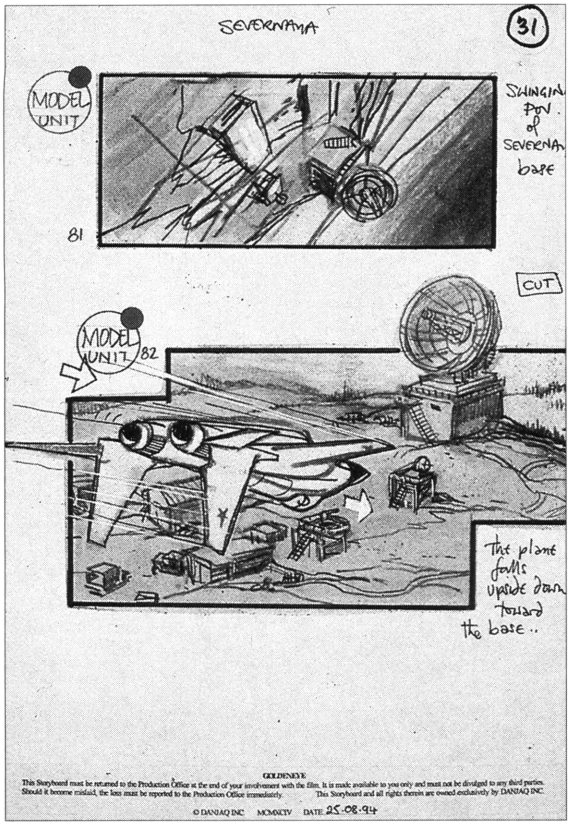
Just as the British Secret Service portrayed in the Bond films is always planning its covert activities behind some innocuous front business like "Universal Export," Meddings and company converted an abandoned Rolls Royce factory at a derelict airbase into a miniature studio for *GoldenEye*. With studio space at a premium in England, Leavesden airfield — just ten miles north of Pinewood Studios, home of the infamous "James Bond stage" — seemed the ideal locale to build and shoot *GoldenEye*'s models.

Among the first and most involved miniatures Smithies' crew of 14 modellers constructed was a poison gas factory featured in the de rigueur pre-title sequence. The factory was mostly established through two different scale models: a larger-scale miniature of just the factory itself for close-ups, and a massive Swiss Alps landscape surrounding a smaller model of the factory, situated atop a towering cliff, for wide shots to match the live-action location footage. "We built the factory and Swiss mountain landscape on our backlot at the airfield," Smithies recalls. "It was pretty small-scale, but in its entirety the set was actually huge!"

The airfield itself even became a location for the film — with a lot of help from Meddings. On the end of the runway, the production built the lower story of the poison gas factory as a full-sized set, and Meddings used his ingenuity to complete the scene in-camera. "We shot a still of our miniature, then I had it blown up into a large photograph, 10 feet wide by six feet high, which we mounted onto a sheet of glass," Meddings remembered. "Then we put the glass between the camera and the set, which was 300 yards away, lined it up with the real runway here and shot it all in-camera. That way, you see Bond chasing a real plane on the real runway with all these Russian troops behind him and the entire factory in the background, and it's all done in one shot and looks really good. It's very much a foreground glass shot, which is nothing new. We've done this type of thing before."

Of course, Bond never leaves an enemy base standing, so Meddings and Smithies had to blow up the poison gas factory — not once, but twice! Since the factory model they destroyed measured six feet across its base and stood 30" high, the trick was to shoot at a very high frame-rate to give a sense of mass to the fireworks.

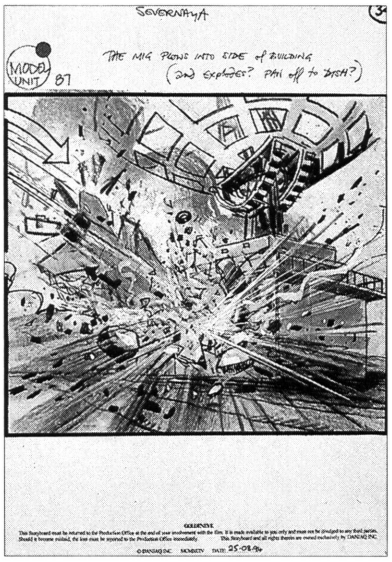
Some of Meddings' most inventive effects work occurs in a lengthy sequence near the beginning of the film, in which a Siberian radar station is destroyed. "The whole exterior Siberian landscape was created in miniature on the backlot, including the radar station," Smithies relates. "The pro-



Director Martin Campbell's original storyboards of the crash sequence. He was quickly convinced of the model unit's ability to deliver complex effects without resorting to expensive digital techniques.

duction never went to Siberia, but you'll never know it!"

As with the poison gas factory, two scales of models were used: a very small, 1/76-scale model provided more scope to the landscape surrounding the station for the initial approach, while a massive 1/7-scale closeup radar station and its environs played a significant role in one extremely ambitious forced-perspective shot. The director wanted to show a Russian agent climbing out of a bunker in the foreground and a dogsled racing through the background, with the radar station in the middle-distance — all in one breathtaking shot! Through clever strategizing, Meddings devised an in-camera sandwich with the 1/7-scale miniature radar station as the beef between the live-action foreground and background! "The runway at Leavesden gave us a hard flat area to build on and a solid surface for the sled to ride on, so that's where we built the whole landscape — all the trees, the huts and everything," Smithies says. "We disguised the runway itself with snow, and built this big, 14-foot diameter radar dish on top. Then we played with the perspective so it could all happen live: Boris came out of this underground bunker in the foreground; in the middle distance we had this radar station which was all model; and then in the background a dogsled rode in front of the mountains, also live-action. So we had a first generation in-camera sandwich! It's quite an excellent shot." The Siberian radar station only took one day of testing and one day to shoot Meddings' way.



A secret installation — a giant radar dish built below ground and covered by a manmade lake — conjures memories of Blofeld's volcano/hideout in *You Only Live Twice*, and provides the perfect locale for *GoldenEye*'s spectacular climax. As Bond and his femme fatale ally, Natalya Simonova, are about to give up their fruitless aerial search for the installation, a missile erupts from the center of the lake, shooting straight through the wing of their Cessna aircraft. The plane crashes, bouncing along the surface of the water, then smashes into the trees at the side of the lake, all of which was engineered by Meddings using Smithies' miniatures. For the long shot, both the Cessna and the landscape were built as miniscule 1/72-scale models so the aircraft could be flown on wires over the lake in-camera. A separate 1/6-scale miniature aircraft was also flown on wires, then crashed into a 1/6-scale lake section.

Despite all the wirework, there was no need for computers. "I've spent my whole life losing wires on flying airplanes," Meddings said. "While we were spending a little time making sure the wires were properly backlit so the light wrapped around them, someone said, 'We'll have to lose the wires on the computer' and I replied, 'You won't have to, because you won't see them.' They didn't, and they were quite surprised because the person who said it was computer-aged: they only think these things can be done on the computer. They don't seem to have looked at any old films and thought, 'How did they do that?'"

Plenty of people will be asking that same question when they get a look at what happens next in that particular scene. "Suddenly water erupts from this seemingly placid lake, as these three huge towers rise out of the hills surrounding it," Meddings explained. "Suspended between the towers is this triangular geodetic structure — the radar collector that focuses the beams into the radar dish — which comes out of the middle of the lake. As the antenna towers rise, the 'lake' drains, revealing a giant radar dish, measuring 1,000 feet across, built into a depression in the ground. We did all of this with miniatures and it worked pretty well."

Believe it or not, the radar dish itself really exists: it was built in Arecibo, Puerto Rico by Cleveland University to listen for sounds of intelligent life in the universe. Since the Arecibo dish isn't really camouflaged by an artificial lake, the *GoldenEye* crew was only able to shoot a very limited amount of live-action establishing material there; for the rest, the production relied on Meddings and Smithies, who duplicated the entire site in miniature.

And what a miniature! Smithies' crew built the radar dish itself out of concrete, which they then faced and painted to look like perforated metal. It was surrounded by a finely detailed fence made from aluminum Smithies had specially extruded. "Because of the enormous size of the real dish, our very small (1/20-scale) miniature dish measured 50 feet across!" Smithies says. "And the whole landscape site miniature

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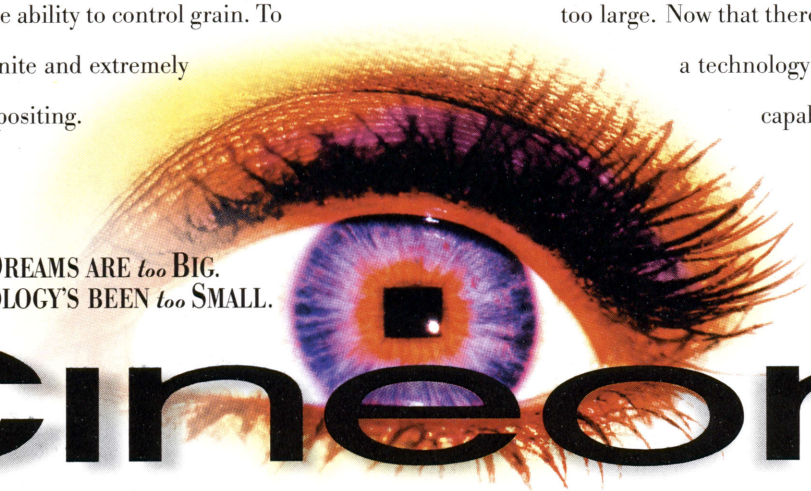

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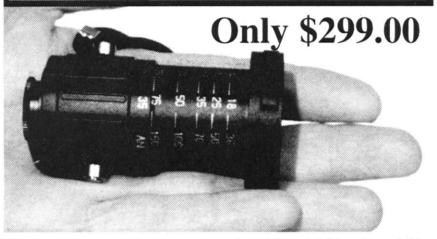

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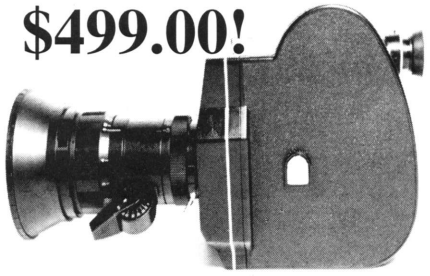

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surrounding the dish was double that. We had to design it to be a certain massive size, because of the nature of the problems we had dealing with water, yet we still had to make it manageable within our budget restraints."

Smithies constructed the three towers surrounding the lake, and the large geodetic triangle suspended between them, out of lightweight dural-aluminum, so Meddings could raise the radar collector structure out of the hills in-camera. "We had to use aluminum for that structure because even at 1/20-scale, it was very heavy," Smithies reveals, "and we had to be able to lift it out of the water using hydraulics. The miniature landscape itself was elevated so the towers could be set into steel runners underneath the hills. We used computer-controlled hydraulics because we wanted a soft start and soft finish, and we had to coordinate exactly so everything came up level. The tallest tower stood about 16 feet above the water."

That is, as long as the water lasted. As the triangular antenna rose, the water erupted violently, then drained from the lake, revealing the huge radar dish built into the ground. "We did the eruption of the water using mostly compressed air and outboard motors, shot at high-speed, which was a particular view the director wanted to signal the draining of the lake," Smithies adds. "Draining a dish that size was like emptying a swimming pool; it took forever before you could see the water level drop. We did several cutaways so the audience wouldn't have to sit there waiting for it to drain."

Although Smithies built a couple of larger-scale close-up sections of the dish, several shots of the 1/20-scale landscape miniature were intercut directly with the real Arecibo dish — almost seamlessly. "The director said our dish actually looked rather better!" Smithies laughs. "When you see it on screen, you don't appreciate how small the scale was. It worked very well." For a final finishing touch, Meddings and company even flew in-scale model helicopters on wires over the dish miniature.

Meddings also skillfully created a battle between Bond and his traitorous adversary, Agent 006, atop the receiving antenna suspended 500' above the radar dish, using miniature figures of both characters operated by wires on the 1/20-scale model. The director intercut the miniatures with live-action close shots of the actors. Meddings then boldly shot the climax of the fight, when 006 falls 500' to his death on the dish below, using the miniature figures. "It looked excellent," Meddings proclaimed. "It was so believable that they decided not to do the shots they'd planned with the actors or stunt people against greenscreen."

Naturally, Bond destroys the secret complex, blowing up the suspended antenna, which then plummets through the radar dish and into the underground laboratory and control station below. But when Bond blows something up, it only needs to be done once; that's the difference between secret agents and effects virtuosos. "We did in fact blow up the whole model three times!" Smithies says gleefully, noting that while his miniatures inevitably came apart cleanly, they rarely went back together easily. "Each take gets harder and harder. By the time the model's fallen from a great height, it's all pretty well pre-bent for the next shots! The towers remained standing afterwards; it was really the center receiver structure that went crashing down into the base below, accompanied by a chain of explosions. We built the base in miniature, then actually crashed our miniature aerial through it. Afterwards, we had to unbend everything, put it back together and hang the antenna up again for takes two and three. We had to drop everything simultaneously, and detonate about 15 or so pyro charges sequentially — and manually —so there would be something happening all the time. The timing was critical, but using a computer wouldn't have helped; the human element is what's important in these things."

Meddings had begun to fear that this human element was becoming lost in a special effects field ever more dominated by digital technology. But *GoldenEye*'s

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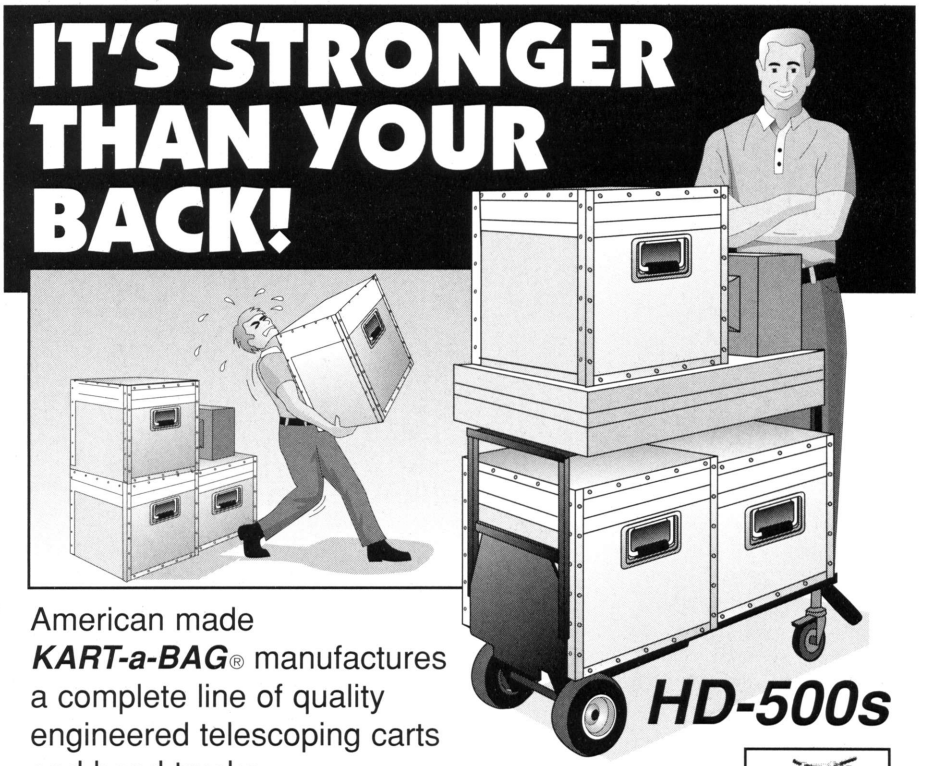


spectacular models and in-camera effects rivaled any of Meddings and Smithies' previous low-tech collaborations, while the breakneck pace reminded them of their early days working together on the *Thunderbirds* TV series. "We used to work at an incredible rate on those," Smithies recalls wistfully. "We did 120 shots in two weeks! Although our *GoldenEye* budget was small compared to a lot of modern pictures, it was nice to throw the brain at it rather than money. Using first-generation effects was exciting. It kept a reality that I think Derek was ace at, and it kept the film personal."

But producers didn't always appreciate Meddings' personal touch in this automated age, Smithies remembered: "I don't think Derek ever got his due — not for what he really did. A lot of his work was, if you like, secret effects. Some producers would look at Derek's effects extravaganzas and say, 'Well, what did he do on that? There weren't any miniatures in it!' Meanwhile, people who made obvious mistakes — if you can see it's a model shot, that's a faux pas — got lots of work. Derek suffered because producers didn't realize he had done certain effects on certain films, which is a shame. He had a really consummate skill: his work was exciting but not visible as miniature effects. That was his greatest achievement, but also one that attracted perhaps the fewest kudos because the work wasn't obvious. To me, that's what good effects should be about."

The mantle of Les Bowie and Derek Meddings has now been passed to Brian Smithies, who vows to continue the tradition of planning superb miniature and glass shots in-camera. "I'd dearly love to continue within the same vein and on my own account, but I think Derek will be very sadly missed, both as a person and a craftsman. The people who worked with him benefitted to such a huge degree from that experience. His death left us all totally devastated. He had a lot more mileage in him, and it's just so tragic. But Derek has left an incredible legacy, and that legacy is very much alive."

A Special Year for Effects

AC presents its annual roundup of the year's most interesting effects work.

The more things change... Pundits predicted that the only fossils left in the wake of *Jurassic Park*'s digital dinos were traditional effects techniques, and in the case of the next generation of computer-generated characters, as seen in *Casper* and *Species*, they were right. But synthetic actors have quickly become the traditional stomping ground of digital technology — the surprise is how far they've advanced in the two short years since *Jurassic Park* first roared onto the scene.

But in the realm of synthetic environments, the big effects news this year is miniatures. While a clever use of CG enhanced *Mortal Kombat*'s exotic Thai locations, and effectively transformed modern Ireland into the Scotland of old for *Braveheart*, those were the exceptions. Models expanded the horizons of futuristic fantasies like *Judge Dredd*, *Waterworld*, and *Batman Forever* — though the illusions, to be sure, were enhanced by CG. Similarly, miniatures played an important part in recreating the diverse realities of a space launch for *Apollo 13*, a runaway train for *Under Seige II: Dark Territory* and a lava flow for *Congo*.

The continued use of miniatures further validates the life's work of one of visual effects' great unsung heroes, Derek Meddings, who died shortly after completing the entirely in-camera miniature effects for the latest James Bond adventure, *GoldenEye* (see coverage beginning on page 46). In a 35-year career begun before the advent of motion control and over far too soon on the cusp of the digital age, Meddings created magic with models and little else — defiantly so at the end, when all producers could think about was how to get their next digital fix.

Meddings' talent and artistry graces hundreds of British TV episodes and scores of international feature films, and, as his friend and co-worker Brian Smithies noted, "gave pleasure to an awful lot of people." Many of Meddings' fans, inspired by his work and that of Willis O'Brien, Ray Harryhausen and Meddings' mentor, Les Bowie, can be found throughout effects houses large and small, pioneering new techniques and improving old ones.

In this special section of our December edition, we offer a review of some of the year's most impressive effects wizardry. For the inspiration and the pleasure he provided, we sadly dedicate this issue of *American Cinematographer* to Derek Meddings — a pioneer in his field and a true gentleman.

— Ron Magid

Photo by George Whitear

***Truly a giant in the field of special effects: the late Derek Meddings poses in one of the impressive miniature sets for the new James Bond film* GoldenEye.**

Transparent Effects Make *Casper* a Landmark

In creating a menagerie of ghosts with memorable personalities, ILM has taken CG special effects to the next level.

by Ron Magid

FIRST IT WAS THE MORPHING METAL T-1000 of *Terminator 2*, then the digital dinos of *Jurassic Park*, followed by *Forrest Gump's* computer-generated meetings with remarkable men. Collectively, these films have spelled the death of "seeing is believing" as a viable concept. This year, Industrial Light & Magic has created the first CG performers for *Casper*.

"Casper is no T-rex," opines the film's visual effects supervisor, Dennis Muren, ASC, who ought to know, having received his eighth Academy Award for unleashing the dino-sized thrills of *Jurassic Park*. Nevertheless, what ILM has wrought is likely to send shudders not only through audiences, but effects artists and filmmakers as well. While *Jurassic Park's* formidable CG saurians were onscreen for only six and a half minutes, Casper and his ghastly uncles, Stretch, Stinkie and Fatso, interact with their human co-stars for an unprecedented *40 minutes* of screen time — nearly half the picture. "Five shots in," Muren promises, "you've forgotten you're watching special effects."

Director Brad Silberling's homage to the Harvey Comics character evokes Disneyland's Haunted Mansion, and his micro-directing approach helped his digital actors transcend their CG origins. With Oscar-caliber assistance from Muren, visual effects co-supervisor Stefen Fangmeier and animation director Eric Armstrong, ILM has created. . . well, living, breathing ghosts.

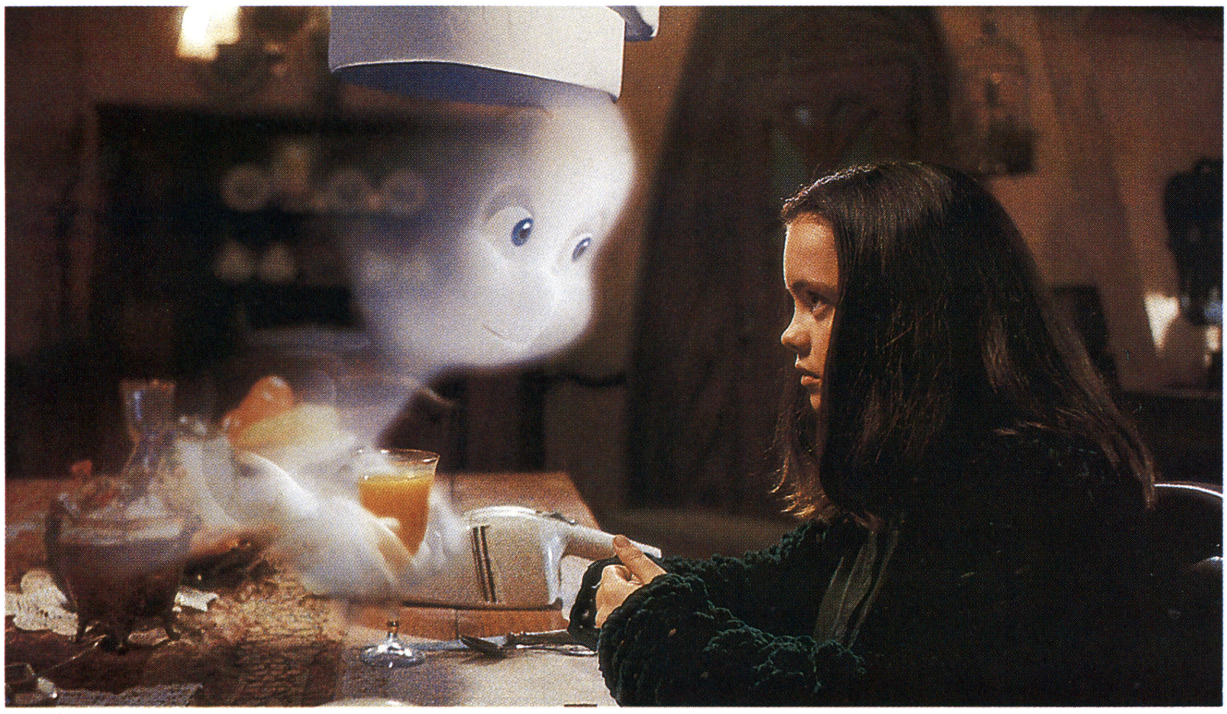
But it wasn't easy. Even attracting talented animators to the project was difficult at first. "*Terminator 2*, *Jurassic Park* and *The Mask* are cool films, but *Casper* appeals most to eight-year-old girls," sighs Stefen Fangmeier. "I believed this was different right from the start. Unlike our usual photorealistic work, *Casper* was much more creative and wide open. Since Casper didn't appear in any other form in the film, as Stan Winston's mechanical dinosaurs did in *Jurassic Park*, we were defining the look of the character entirely in CG, with no real-life reference. That created a very different challenge in the look and lighting side of things."

At first, Fangmeier was sole visual effects supervisor. A former computer scientist who discovered his artistic talent for pushing pixels en route to ILM, Fangmeier worked his way up to sequence supervisor on his first project, *Terminator 2*, before becoming one of the first animators on *Jurassic Park*. As *Casper* got rolling, he translated the sculpted maquettes that Amblin's artists had made of Casper and the Ghostly Trio into working CG models. "Amblin's 10-inch maquettes were the end of the design phase for the trio," Fangmeier says. "Although we built our CG model of Casper to match the maquette, we struggled quite a long time to really get him to look cute. There was a big concern on Steven Spielberg's part, whose idea it was to make this film, that Casper would look like the Pillsbury Doughboy, or a plastic toy or a puppet."

Fangmeier and a small team of CG animators succeeded in transforming Casper from the comic's fetus-like bubblehead into a charmingly anxious adolescent. "I made sure everyone who lit Casper obeyed one rule: never entirely fill in his giant head with rimlight, because it looked too literal," Fangmeier says. "He started looking like an alien! We always tried not to make his head too symmetrical, but we were dealing with a big hard surface. To make it look as soft as possible, we needed a little negative space where it went off into transparency.

"Similarly," Fangmeier adds, "we didn't want to make Casper's huge eyes too literal, but we also didn't want them to seem like painted buttons on a doll, especially since so much of the character came through his eyes. We tried to make the iris structure as human as possible, without having quite as much moisture or any little red vein detail you'd see in a real human eye. Beyond that, we made a very soft blend between the eye and the socket, and we always gave our ghosts little glints in their eyes."

Deciding where and how to light each part of Casper's anatomy was inevitably problematic. "We didn't want to put a lot of light on his belly because he was kind of chubby and looked too solid," Fangmeier says. "We just slightly softened the background so it blurred behind him when he moved, as if we were looking through a lens. We limited any refraction to his center because as soon as we put refraction onto the edges, he started to look like glass or water, and Casper wasn't supposed to be the Pseudopod from *The Abyss*! We used an awful lot of compositing tricks to put little glows around Casper and the other ghosts to soften their edges and get rid of hard lines that would suggest a maquette or a solid object. We wanted Casper to be a three-dimensional character who was really there, rather than a traditional flat, two-dimensional ghost that looked double-exposed over the photography. And yet we wanted our ghosts to have a very light, transparent nature, as if they were made out of energy in the air. We talked about a lot of very elaborate concepts, which was interesting because we're not used to that type of creative process when we're matching reality. It was kind



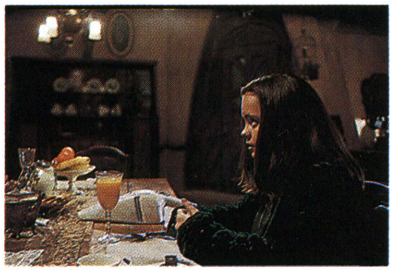
Photos courtesy of Industrial Light & Magic

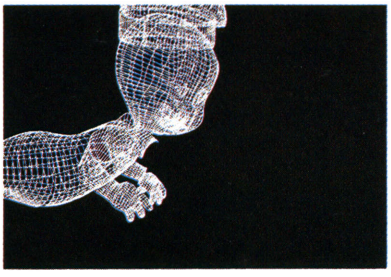
In a finished composite from the film, Casper has a dinner date with his teenage paramour (Christina Ricci). Three stages in the construction of the scene are show below: a shot of Ricci alone; a digital wireframe of the Friendly Ghost; and a combination of the wireframe and the filmed footage.

of liberating."

But modelling Casper and the Ghostly Trio appealingly was only the beginning. For Silberling's film to succeed, ILM had to develop character performance past mere believability and into poignance. That's where another *Jurassic* vet, animation director Eric Armstrong, came in, ably assisted by a handpicked team of CG animators, culled largely from traditional cel animation backgrounds. "I was adamant when we started the project that we bring in a lot of really good traditional animators," Armstrong explains. "*Casper* is really the first film to use CG where performance became the major issue. Through our animation, we created the main characters' personas and defined what they thought and how they showed that thought process. We knew if we could get people who could act through their medium, we could train them to translate that ability into the computer."

All of this took time. The traditional animators underwent a four-month training period before shooting began. Afterwards, though none of the recruits could qualify as computer scientists, Armstrong, himself a traditional animator, was confident he could give Silberling the performances he needed to make *Casper*





work. But once production began — with another ILM top gun, Scott Farrar (*Backdraft*, *Congo*), shooting background plates on-set at Universal Studios — both Armstrong and Fangmeier grew more and more anxious about the ever-increasing number of shots, which burgeoned from 150 in preproduction to 320 by the end of principal photography!

Enter Dennis Muren. "At 150 shots, *Casper* was three times the size of *Jurassic*, but it got bigger and bigger as they were making it," Muren confirms. "From the get-go, one of the major challenges of the show was how to put so many shots through. There was enormous recruiting going on before the show even started, and Amblin' was aware we were going to spend time training people, so there was no mystery to it and no surprise. The only thing was, our search hardly ever ended! We thought we'd be done when we had 15 animators, then 20, but that still wasn't enough! Still, everything was in place and we were all prepared. So we brought more animators in, trained them, and we ended up with about 25 animators whose skills ranged from excellent to really good, especially after getting through this show. But we never believed we'd do this many shots."

The ever-practical Muren and his visual effects producer, Janet Healy, quickly assessed the situation and immediately turned their attention to motion-capture technology. Motion capture involves filming performers from many angles to precisely track their movement in 3-D space; when that

Casper's distinctly unfriendly associates, The Ghostly Trio, engage in an ingeniously realized duel with actor Bill Pullman.

information is fed into the computer, it becomes the basis for CG characters' performances. It was also a sure-fire way for Muren to get all of *Casper's* shots done on time. "I wanted it to work for that reason," Muren admits, "but [the results made the characters] look like [ordinary] people; there was nothing wonderful or fanciful about them, and they just didn't look as good as what we wanted for a major motion picture. What we got looked like rotoscoping. That might have been good enough for some, but not for us."

Nevertheless, Muren and Fangmeier realized that motion capture could be a useful tool for accurately animating the lips of *Casper's* CG characters, "especially in those scenes that go on for 20 or 30 seconds with a lot of dialogue," Fangmeier says. "The person doing the lip-sync did it with a neutral face, which only gave us the correct timing of consonants and other sounds on certain frames, not the emotions. Then the animators imposed different emotional shapes on top of that lip-sync. However, applying the motion-capture data took us roughly a month for each character, because we had to map the motion hookup points onto the face. A lot of animators used the motion-capture data as a starting point, but then some of the quicker ones decided to do it old-style; it was an individual choice."

Somehow, under animation director Eric Armstrong, more than a score of newly-trained CG animators muscled *Casper's* workload through. Working on a broad range of Silicon Graphics workstations — Onyxes, Indigos, Indys — they used Alias software to create each character's wire-frame structure, Softimage to animate them and Renderman to render the finished CG actors, much as they had done with the behemoths of *Jurassic Park*. But that's where the resemblance ended, as the animators attempted to endow *Casper's* ghostly ensemble with real personalities.

Fortunately, they had a little help from Amblin's in-house animation director, Phil Niblink. Because the ghosts were the stars of his film, director Brad Silberling insisted on having as much input into their performances as possible. Niblink's team created traditional 2-D animatics over an edited series of background plates which provided Silberling with his first take on each sequence. "We had very different roles," Armstrong points out. "Phil's team at Amblin' in Los Angeles would do very rough, hand-drawn pencil drawings which we used as templates for our 3-D work. We'd discuss the shots with the director, then interpret the basic blocking of Phil's animatics into CG. There were certain things they could do in 2-D that we couldn't do, and vice-versa. Once we tried to do a fully-rendered, in-betweened 3-D animation based on the rough animatics, certain actions wouldn't translate properly, so the shots became very different. There was a lot of interpretation involved, but the animatics were certainly very helpful."

Armstrong's animators struggled with the performances of Casper and the Ghostly Trio under the watchful gaze of Muren and Fangmeier, who also attended to other specific effects-type shots, such as the exterior of the whimsical haunted house. But the technical issues of endowing *Casper*'s ectoplasmic stars with life sometimes seemed overwhelming, even to Muren, who quickly learned that CG character animation was even harder than animating digital dinos. "That surprised me," he says. "These aren't single-minded killing machines; they're expressionistic actors. CG is a very difficult tool to use compared to a drawing or claymation or stop-motion, because of the time it takes to get fluid-looking motion, and to get the right comic or dramatic accents on the right frames."

And that challenge wasn't the half of it. Throughout the film, the Ghostly Trio are constantly metamorphosing: Stinkie's head transforms into a tennis shoe to give Casper a swift kick, while Stretch does a literal impersonation of Little Richard. Such legerdemain is effortless in cel animation, where a line is a line, but it's hell in CG, where every incarnation requires a separate model. Somehow, ILM's newly computer-literate traditional animators didn't go into culture shock. "I have to give so much credit to the animators themselves," Armstrong says proudly. "In traditional cel animation, it's easy to transform a character into a running shoe. The technique stays the same. In CG, it's almost more like stop-motion, where once we build a model in the computer, it's designed to move and react in certain ways, which creates limitations. On *Jurassic*, we never wanted the dinosaurs to exceed their physical limitations; once the models were built, they could basically do everything we needed them to do. But *Casper*'s ghosts were supposed to be cartoons that could do anything — change shapes, sizes, everything — and each time they did, we had to build a new model. I couldn't begin to describe the number of models we created for this film. At the very least, we had to edit every model on every shot we worked on, and for many, many shots, we had to create a whole

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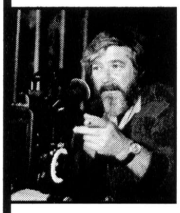

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new model when the existing ones couldn't do what we needed."

Consequently, there was a lot less improvising going on than one might gather from all the spontaneous ghostly shenanigans onscreen. Particularly impressive is a slapstick duel with swords, umbrellas and plungers that pits Doctor Harvey (Bill Pullman) against the Ghostly Trio. The battle climaxes with the good doctor using a handy Electrolux to vacuum up his foes. "That was one of my favorite parts of the film," Armstrong says. "It's really an action sequence with the ghosts swordfighting like Errol Flynn, with a nod to Chaplin. But this sequence exemplifies the problems we were facing on this show. Shots like Stretch's face being pulled by a plunger and physically stretching, or the Ghostly Trio being sucked up by the vacuum cleaner, took on major technical issues. All of those shots had to be really thought through ahead of time.

"Also," Armstrong continues, "we were creating characters you're seeing from cut to cut in entire sequences, rather than the big general effects shots ILM has created in the past. Suddenly, the characters are there all the time, and it became really important to think like a traditional character animator would — in terms of how the character performs not just in the shot, but how he evolves and transitions through the entire sequence. So each day as we did our takes, we cut them into the sequence to make sure all those cuts worked in context."

Another standout sequence involves Casper scrambling eggs and straining orange juice for Kat (Christina Ricci) and Dr. Harvey, then feeding cookies and cake to his ectoplasmic uncles. Unlike the manic swordfight, this tour de force scene is very deliberately paced, and goes on for *minutes*. "The breakfast sequence was the first one we did, and it was demanding because the animators were defining and developing the characters," Fangmeier says. "On top of that, our CG performers were interacting with a lot of objects on-set, like the Ghostly Trio eating all this junk food and Casper pouring the juice for Kat. We had somebody on-set at all times to decide which props they should film practically and which we should re-create in computer graphics. When the Trio grabbed the food off their plates and ate it, that was computer graphics, but when it fell right through them and landed on the floor, that was practical. When Casper pours juice from a pitcher into Kat's glass, we had Michael Lantieri, who built all the on-set dinosaur interfaces for *Jurassic Park*, put the pitcher filled with juice on a rod, because we didn't want to try to re-create orange juice in CG."

Casper's effects even comprised a couple of top secrets ILM is only now willing to reveal, such as the ghostly incarnations of actors Cathy Moriarty and Bill Pullman. "Although they were somewhat exaggerated, they're the closest things to human that we've done," Fangmeier says. "In that respect, it was very challenging. Initially we made them more caricatured, but the director wanted to make sure the connection was obvious and there wasn't too much abstraction. The decision to do these characters wasn't made till near the end of the project. We had so many shots to complete in the limited time left that we had to get the look of these characters down quickly. We made them look very human, especially the doctor: some of his low-lit shots really had interesting shaders, and he almost looked like a person."

In the end, the irreverent, Chuck Jones-ian anarchy of *Casper's* ghostly illusions was matched by the film's surprising emotional range. Casper's brave attempts to reveal his feelings to Kat, the living girl sleeping in his old bedroom, give the film unexpected heart. Perhaps the film's most poignant scene involves Casper and Kat, sitting atop a lighthouse, looking out at the moonlit water as Casper reveals that he doesn't remember what it was like to be alive. ILM's technical directors, along with cinematographer Dean Cundey, ASC, were responsible for creating the beautiful composition of the lighthouse and the moonlit water, while ILM's animators created the performance.

THROUGH THE EYES OF HERB PEARL

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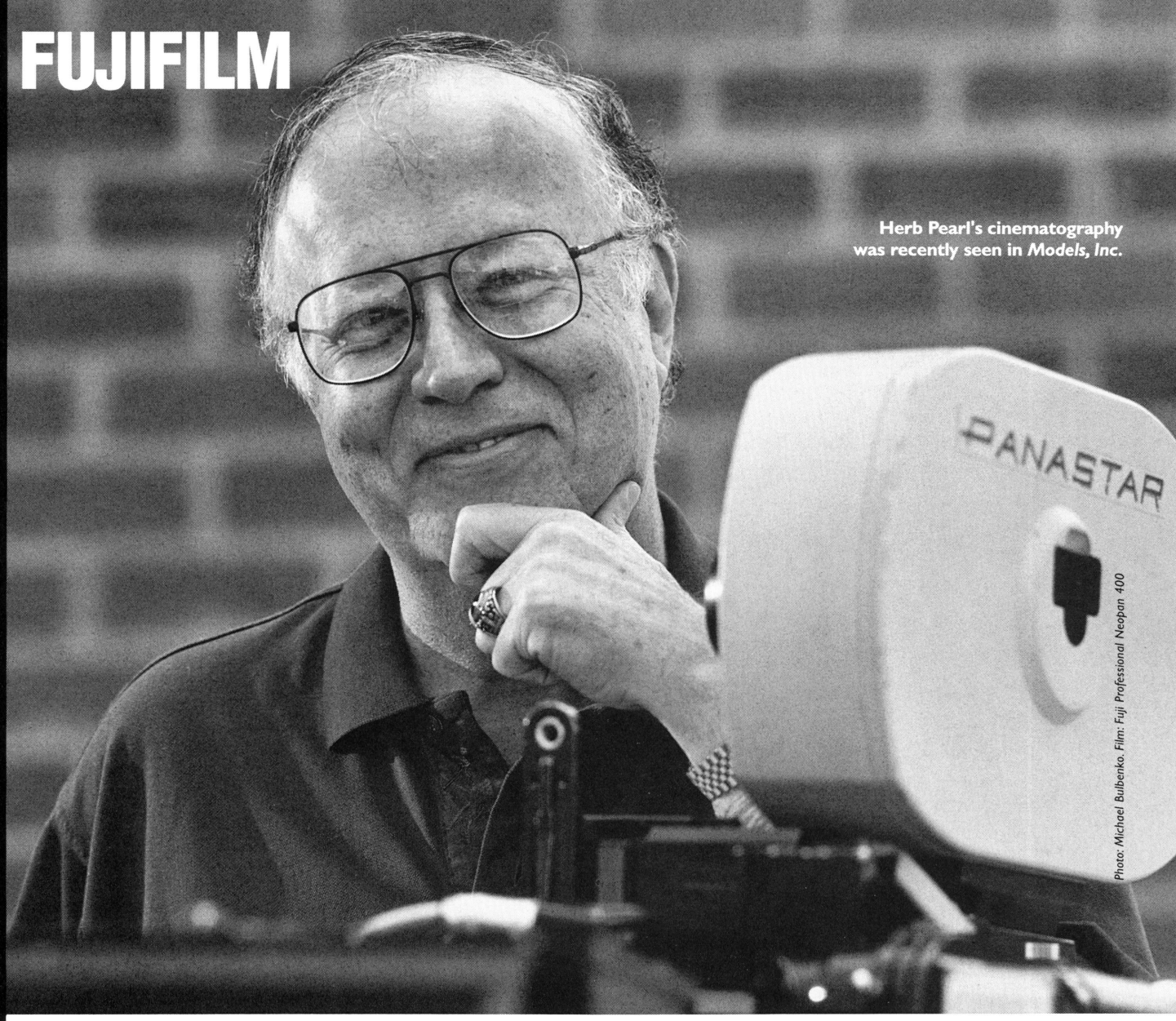

Herb Pearl's cinematography was recently seen in *Models, Inc.*

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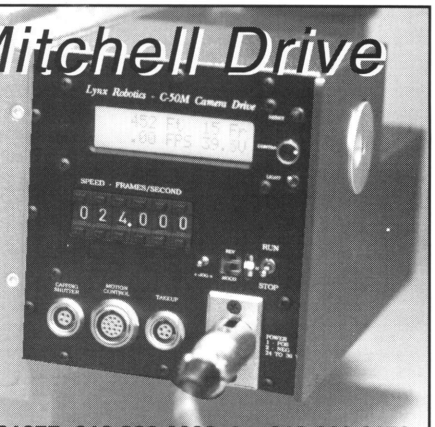

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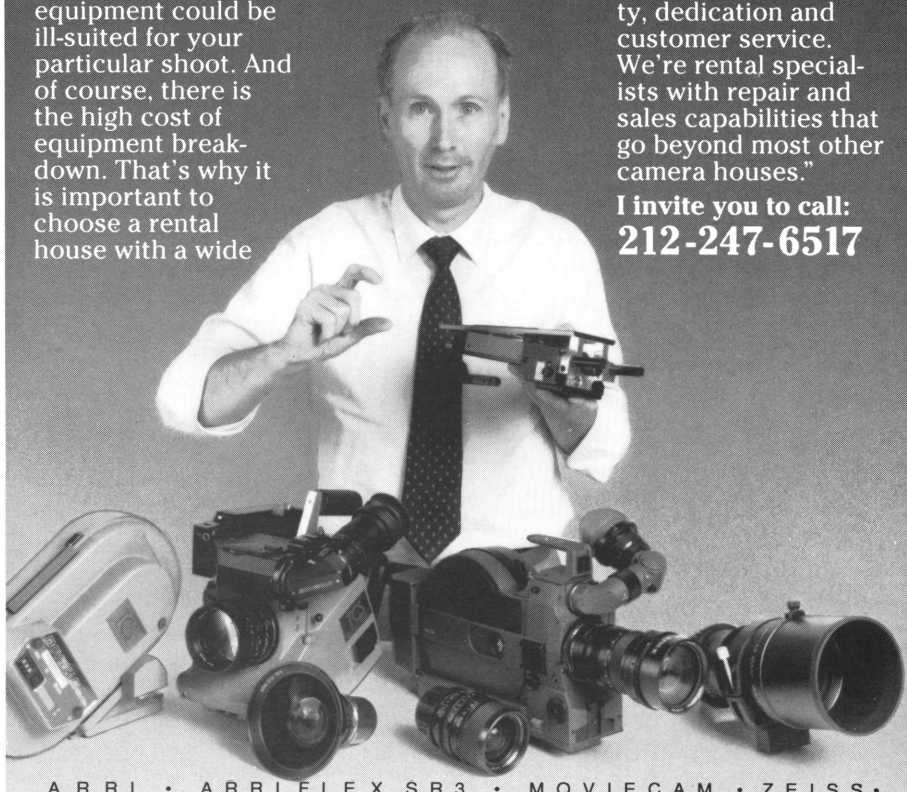

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"That was one of the more important shots in the film," Armstrong says, "and involved by far the most difficult animation in the show. Although Casper remained Casper and did only Casper-like things, which made it technically simple for the animators, the performance issue became hypercritical. The character did nothing but act.

"It was also a critical shot because it helps to define Kat clearly: she finally breaks down and realizes Casper's an okay guy," Armstrong adds. "The camera slowly moves around them during their heartfelt discussion, and she really gets to know who Casper is, what he remembers and doesn't remember. We went back and forth on the animation many times with Brad, refining the performance and making sure that Casper really hit all the nuances and emotions as he interacted with Kat. The animators did a wonderful job of keeping you engrossed in the story and making you feel sorry for this poor kid who can't remember anything, instead of just thinking about him as an effect."

According to Muren, that was ILM's greatest triumph: "*Casper* proved that CG can create the soul of your character, an actor," he says. "It was quite a difficult show, but it was an inevitable step toward doing characters that are totally real — not Marilyn Monroe, but real CG actors. From now on, CG is going to give you character shapes you've never seen before, who'll say things you've never heard before, and you'll believe them, which will be absolutely wonderful. It's been a great education in what really good animation is and how people go about getting it, and I come out of this with tremendous respect and admiration for Disney's *Beauty and the Beast* and *The Little Mermaid*."

But ILM's achievement in some ways surpasses Disney's by creating synthetic characters that we accept as real. While we might not yet believe we're looking at flesh and blood, character animation will get there, and soon. And when it does, the shockwaves will reverberate not only through the effects industry, but through the halls of the Screen Actors Guild.

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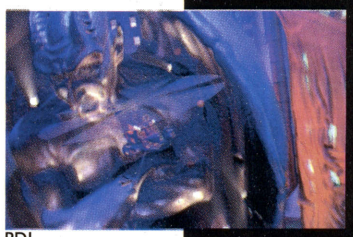
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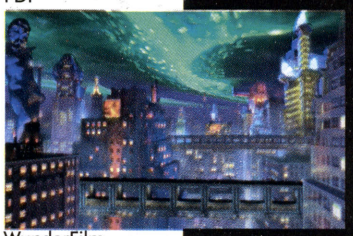
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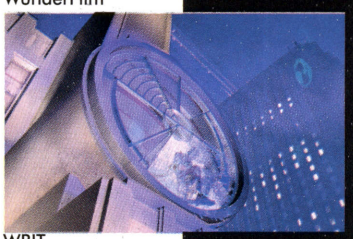
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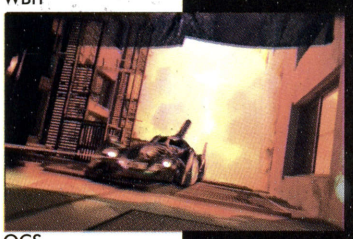
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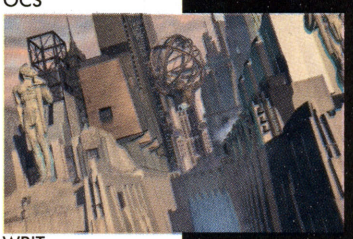
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A computer-generated Sil peers down on her human prey. Boss Film began the CG modeling process by scanning a sculpted 3-D cast, which became the basis for their motion-capture-driven creature.

The Making of a Beautiful Monster

A variety of artists and craftsmen collaborate to create a sci-fi creature with sex appeal for *Species*.

by Les Paul Robley

IRONICALLY, THE COMPUTER-GENERATED hoopla that effects artists initially feared would abolish the miniature and model animatronics aspects of the film industry has done just the opposite. Since *Jurassic Park*, computers have actually generated more work for makeup artists, motion-control operators and miniature builders. Now, combinations of techniques such as computer-generated imagery (CGI), makeup, animatronics and special effects miniatures are often employed together, as in MGM's science-fiction/horror film *Species*. The film's startling effects were the result of a collaboration headed by artist H.R. Giger, visual effects supervisor and Boss Film President Richard Edlund, ASC, and Steve Johnson, the founder of XFX, Inc.

Species is the story of a ruthless, genetically-engineered female (dubbed "Sil") who has been manufactured from an extra-terrestrial formula. After escaping from the lab where she is being observed, she goes on a hunt for human mates with whom she can procreate. The scientists who created Sil are charged with the formidable task of finding and destroying her before she is successful in her quest.

The project was produced by Frank Mancuso, Jr. (*Friday the 13th, Cool World*) and Dennis Feldman (*The Golden Child*), from a screenplay by Feldman. Australian-born Roger Donaldson then stepped in to direct the sci-fi story. Although a genre novice, he is no stranger to thrillers, having helmed *No Way Out* and the recent remake of *The Getaway*. In turn, he brought aboard cinematographer Andrzej Bartkowiak, ASC, whose credits include *Jade* and *Speed*.

Says Donaldson, "I've always loved science-fiction, but there was a particular quality to this film that interested me on another level as well. It's also a terrific thriller, with plenty of good scares, lots of tension and unpredictable twists and turns as the story unfolds."

Origin Of *Species*

To create the film's central creature, Mancuso employed Swiss surrealist H.R. Giger, the artist responsible for the infamous Alien from 20th Century-Fox's successful trilogy. Mancuso was first introduced to the idea of using Giger when Donaldson visited a Southern California comic shop with his son and saw the Morpheus edition of the artist's book *Necronomicon*. The director instantly realized that Giger was the perfect choice to design Sil for *Species*. He then showed the book to producer Mancuso and MGM president Michael Marcus, who were equally impressed.

Mancuso contacted Giger's California publisher and representative, James Cowan. "I thought this would be a worthwhile project for Giger," says Cowan, "because it allowed him the opportunity to design a very beautiful and special creature, perhaps the most elegant design since the Maria robot in Fritz Lang's *Metropolis*."

"We wanted her to be scary," Mancuso notes, "but at the same time have a sensuality that isn't lost when she appears as the creature. There needed to be a constant level of elegance and grace to her character, and H.R. Giger was the only person we could think of who could accomplish this."

From his home in Zurich, Switzerland, Giger recalls his initial contact concerning the film: "I was told this time I could do something I always wanted, to create a monster in another way — an aesthetic warrior, also sensual and deadly, like how my women mostly look in my paintings. Usually, they always want monsters to have a bad-looking, ugly face and horrible teeth. I wanted the lady to turn into the monster and still look beautiful. This opportunity was, mainly, why I was attracted to the *Species* project."

Of course, beautiful to Giger may be a little different from what others consider attractive. Giger conceived Sil in his famous "Biomechanical" style of design that melds flesh with machine; he envisioned a half-human, half-alien armed with an array of natural defenses.

Giger reveals, "I always wanted to have something transparent. Before, it was not possible." To convince dubious producers, who worried that a transparent creature would be too expensive and should be done in CGI, Giger built a rough model of Sil with his

Photos courtesy of Boss Film, Metro-Goldwyn-Mayer Inc. and XFX, Inc.

own crew in Zurich and inserted holograms into its cut-away limbs to show how the transparency aspect would enhance the design and could be incorporated. At his own expense, he commissioned CFX Creature Effects at Pinewood Studios to cast a transparent bust of Sil. Although Giger wasn't able to provide a working model of his creature that the production could use, his preliminary creations sold the producers on the idea of transparency.

"I had a very good relationship with Frank Mancuso, Jr. because he called me every night to talk about the movie," Giger remembers. Along with friends Cony De Fries and Andy Schedler, Giger created the first *Species* heads and skulls, using a Swiss model named Nadia as a basis for his designs.

Similar to the way he worked on *Alien*^{3}, he faxed many ink drawings of Sil to Hollywood, later supplying some airbrush paintings. "I was convinced we could do this thing here in Switzerland," he confesses. "But eventually I realized that the people here did not have the experience or technology."

Giger had specific ideas concerning how the creature should change in the film. Sil is first seen in the lab as a young girl, played by Michelle Williams. Later, after breaking free, she quickly matures into a striking adult, played by model Natasha Henstridge.

Originally, Giger wanted Sil to go through distinct stages of emotional evolution. "She's searching for good-looking, healthy men to breed her race on Earth," he says. "When she gets angry, she first becomes dark red, then orange-red hot. Her clothes and hair burn off, revealing sharp spikes coming out of her back. Her body weapons are like red glowing steel. Then she cools to transparent carbonized glass and you see her interior bone construction, her veins, body organs and discs." At this stage her killing cycle begins and she loses her transparency.

Giger also wanted to incorporate an unused idea from *Alien*^{3} whereby the creature's tongue would be composed of barbed hooks. While kissing her lovers, Sil would force her tongue into the victim's throat, then yank his insides out. To help Giger conceptualize this grotesque idea, his agent Leslie Barany even sent him a set of shark jaws from New York. Ultimately, Sil's Deadly Kiss was rejected in favor of the old *Alien* standby, the "Chestburster" — an object bursting through bone. In *Species*, this idea metamorphosed into the Chestbirther.

Throughout the production, however, Giger expressed much concern over the way *Species* seemed to copy elements of the three *Alien* films.

"In retrospect, I would say the people behind *Species* went out of their way to invite comparisons," laughs Barany. "If they were truly serious about this, they would probably have approached someone else to create their Sil, or at least trusted Giger to steer the designs in a fresher direction. In my opinion, the producers wanted Giger's name attached to the film at least as much as they sought his designs." The extensive use of his name in the marketing of *Species* has finally convinced Giger of that. "I am certain MGM agrees that Giger's name, alone, was worth every dime they did pay him," Barany concludes.

Species' Makeup Effects

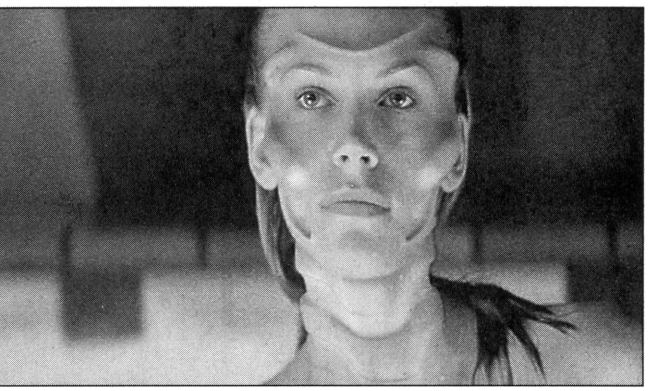
Steve Johnson, founder of XFX, Inc., was brought onto the *Species* project to realize the life-size animatronic versions of Giger's alien. Having previously worked with the artist's designs at Boss Film on *Poltergeist 2*, Johnson was familiar with the artist's style.

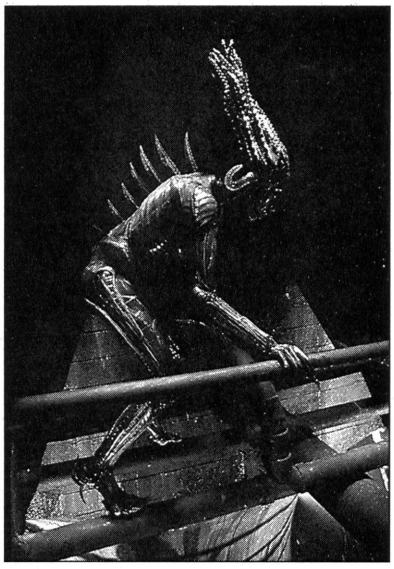
"It was great to work with Richard [Edlund] again; he was the real reason I got this job," he admits. "I think he wanted me because we had a good working relationship together when I was head of the Creature Shop at Boss on *Big Trouble in Little China* and *Predator*. There was an entire X-factor eliminated at the beginning."

During their 13-week schedule, Johnson and his crew tried to "think like Giger" and constantly referred to his books throughout their effects ordeal.

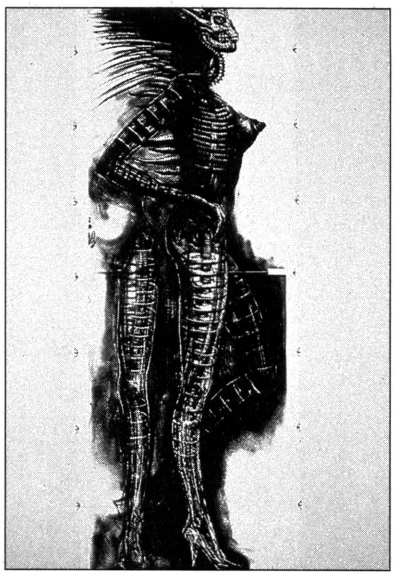
"Giger's designs are fluid, marked with raw motion on the canvas, and they are incredibly erotic," he points out. "When you're asked to bring one of his creations to three dimensions it's a difficult thing to achieve because you have to take a loose, fluid approach to it. I think one reason the entire process turned out as well as

After manipulating their real-time motion capture Sil puppet, the CG artists were presented with the resulting polygon figure, which was enhanced to full-resolution and composited with a cave background. Edlund felt CG to be the only way to visualize the creature's inhuman athletic abilities.





Above: ***The human-looking Sil (Natasha Henstridge) reveals her true self. Boss Film utilized CG to enhance traditional prosthetics. The translucent creature's design by H.R. Giger (above right) was also brought to life as both an animatronic puppet and full-body suit (right) by Steve Johnson and XFX, Inc.***



it did is that we stayed in very tight communication with him through faxing, phone calls and FedEx. We kept him very much in the loop and always listened to what he had to say."

"One of the coolest elements of the creature was that it's translucent, so it couldn't be done in the normal way," Johnson notes. "Our creature has a complex skin that allows light to penetrate as well as play across the body structure. One thing that helped us out a lot was all the materials research we'd done for *The Abyss* for the floating aliens at the end."

Johnson had decided early on that he wasn't really thrilled with the way puppets were normally built. "You do a sculpture, a mold, a mask, then a paint job. I feel it doesn't always move naturally or organically, or doesn't wrinkle upon itself naturally. I wanted to make something much more organic for this film. It was my major goal to do that and make Giger happy."

To realize Sil, XFX made several full-body animatronics with replaceable, clip-on arms, heads and torsos, with interlocking mechanics designed by Eric Fiedler. At first, Giger felt this model's face was too "ape-like," so Johnson adjusted it. "You're talking about a creative change of about a ¼-inch, and the untrained eye wouldn't even be able to notice it," he explains. "Not a big deal — we just added a clear dome over her forehead."

Her head was made up of two layers: a Giger skull with a lovely face on top. Bands of texture were placed beneath the exterior skin so that shapes moved underneath like muscles to create expressions. Giger was extremely pleased with the final result.

Sil was ultimately put on screen in four different ways: using full-body animatronics, Boss Film's CGI images, a combination of the two, and an elaborate suit which was worn by kick-boxing Olympic Gold Medalist Dana Hee for brief shots of the creature jumping into water and bursting through a door.

For a nightmare sequence, Johnson used another suit — shot underwater. They then reversed the film in post to give it an eerie, otherworldly quality, with strobe lights flashing behind and in front. He explains, "I wanted to really break up the human form, [similar to] what Giger did with the Alien — so you didn't quite know what you were looking at."

To that effect, Johnson added three 12-foot tubes growing off the back of the creature's head, as well as a series of eight 12-foot crab claws on its back. "In the water they moved beautifully and really served to break up the human form, because there are tentacles and things flying all over the place," Johnson describes. "When Giger got the 20-minute [footage I sent] he said he could watch a whole movie of it." Unfortunately, Donaldson saw fit to use only a few seconds of it in the film.

Sil's first shot in the film was made doubly difficult because she appears in a Jacuzzi. Says Johnson, "Any time a puppet works in water, it's always very difficult because it's harder to move in and what you build has to work mechanically and cosmetically in water."

Johnson's most complicated sequence, however, was in the lab when the creature is reproduced in its "pure" state. "We used over 20 different puppets to create a two-minute sequence. It was one shot after another, with each shot requiring a separate strategy: gravity tricks, different puppets, opticals. We were very excited about it, and very nervous.

"We took a lateral approach to the cocoon and several of the lab creature effects. We show this organism grow from a single cell throughout 20 different effects all the way into a 10-foot long chrysalis.

"Chrysalis supervisor Bill Bryan and I came up with a way to actually create creatures without using rubber molds — a real organic, lateral approach to actually creating animatronics. What it basically involved was forming layers of polyurethane plastic that we then manipulated with pneumatics by applying negative and positive air pressure. We then painted them with colored gels, overlapping them. So we ended up with something that moved much more organically than a foam rubber piece ever could — muscles moving underneath, skin sliding on top of that and wrinkling where it naturally would. I'm very pleased with that. It's probably one of the most innovative things we did in the film."

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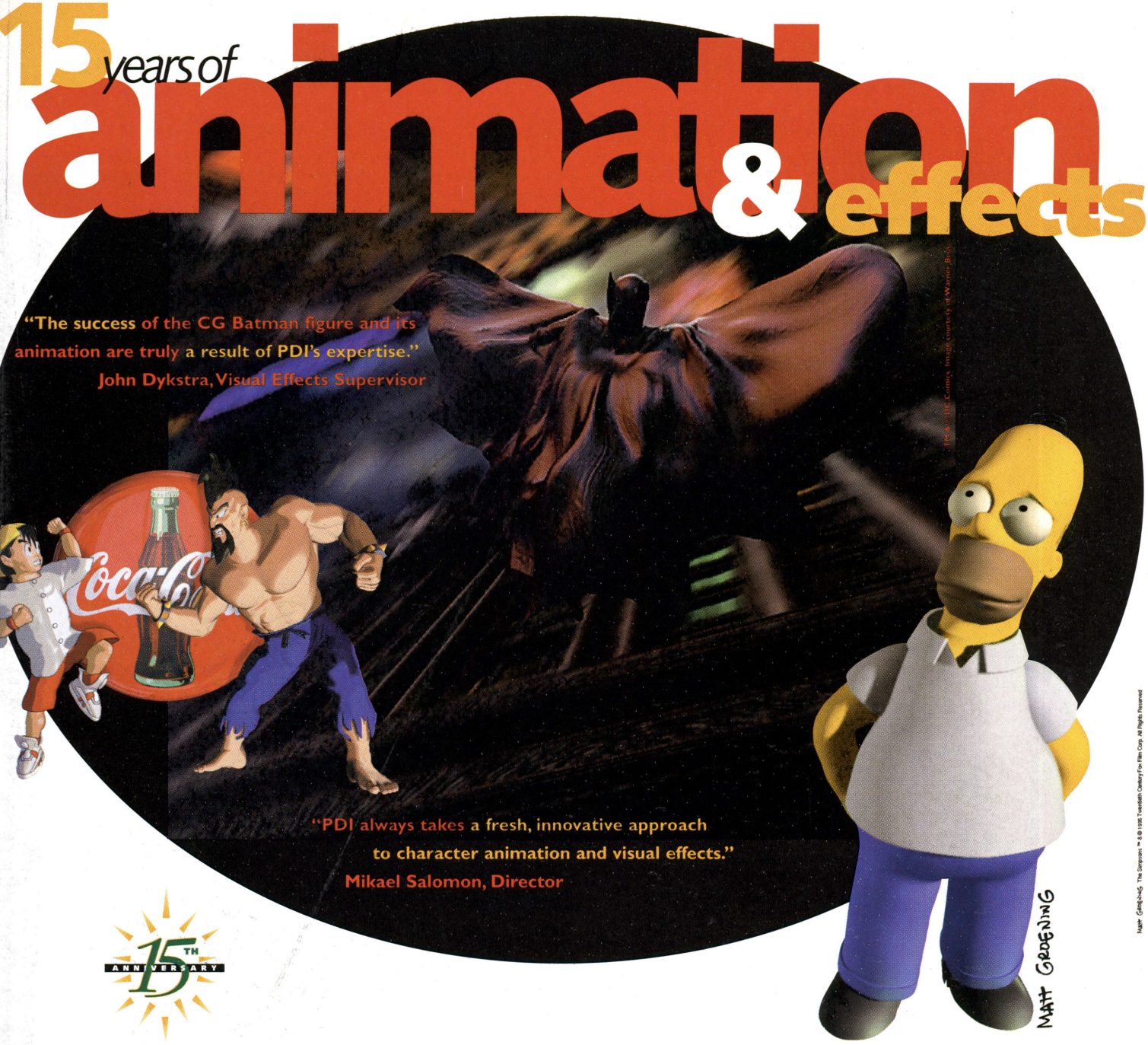

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Johnson's team of 40-plus effects artisans also contributed to the scene where a young Sil in human form (Michelle Williams) breaks through her glass cage. The crew first made a life-casting of the actress' arm in a fist and built a duplication of it over a hydraulic ram. The mechanical "fist" literally smashed through a 2½" piece of real glass, providing a more realistic look than breakaway glass could have accomplished.

Another instance of traditional effects trickery occurs as the older Sil emerges out of her cocoon and hangs from a bathroom ceiling. The crew filmed the sequence upside-down to make Sil appear to defy gravity. The actress simply stood up through a hole cut in the set, worked her way out of the chrysalis, reached her arms straight up out of frame and grabbed a trapeze bar, which yanked her up and out of frame.

To show an allergic reaction after a rapidly-maturing pubescent Sil gorges herself on chocolate bars, Johnson fashioned Williams with bloated "fat" makeup. Her skin writhes as if worms are moving beneath the flesh, which then erupt out of her face.

"I'm real pleased with that and think it's really magic," Johnson enthuses. "It was done very simply, but in a way that no one will be able to figure it out. It's a combination of two very distinctly different techniques, one being makeup effects and the other CGI. She has appliances on her face and underneath those are little buttons. We attached mono-filament to those buttons, and just out of frame, pulled the wire. The computer department took care of removing the wires. There's really no other way you can get that direct kind of movement.

"Then we went to another method and had the worms actually break through the skin using the same technique, [using] prescored skin on top of the buttons so it would look like a worm beginning to grow out. Once that had gone three or four inches, then the CGI took off."

Humorously, the shape of the worm-like excretions was the result of a misunderstanding of Swiss artist Giger's suggestions. The artist had told Johnson by phone that they should resemble "pickles" growing out of her face. But, in Giger-ese, "pickles" meant "pimples," and so he ended up with kosher dills coming out of Sil's skin.

CGI would be married to many of *Species*' other makeup effects sequences as well. For the grisly severing of Sil's thumb, XFX cut off a rubber thumb, and Boss Film grew it back. For the birthing scene, Johnson constructed a special Sil puppet whose chest split open to reveal an animatronic baby within a cocoon. Once the baby started to grow, CGI again took over.

A form of CGI is slowly working its way into even Johnson's own studio. "Adobe Photoshop is really a good tool for design, plus programs particularly made for character, like Metaphor," Johnson admitted. "What's really neat about it is you can spend a day on the computer and print-out a photograph of a makeup that is so photo-realistic, it looksas if you did the makeup and put it into any environment. It's a brilliant tool to show to clients."

Creating A New Species Using Digital Technology

Once Giger had achieved the genesis of Sil on paper, his work became the blueprint for *Species* visual effects supervisor Richard Edlund to create a CG version of the translucent, half-human, half-alien character for specific scenes — sporting built-in weapons and Giger's trademark semi-mechanical flesh. Even though Edlund, a four-time Academy Award winner, has long been a pioneer in the field of visual effects, he notes, "This is past anything that has ever been done before. It is like building a new violin and learning to play it. With today's equipment and technology, we can do things we couldn't have dreamed of even two years ago." Now the optical printers lie dormant in Edlund's Marina Del Rey facility, as he strives to fulfill his four-phase quest to become a complete virtual studio.

"The phases have to do with the level of quality achieved for the director," Edlund explains. "Phase One was a dinosaur creature we made a while back. Then came *Species*. But this creature is semi-transparent. You see through the skin to her skeletal structure and interior organs. So, the only way you can create this character is by combining a partial puppet and a fully computer-rendered transparent version."

Species is one of the first motion pictures to spotlight a completely "digital performance." And according to Edlund, each frame of Sil's demise in the film's fiery climax is made up of 10 times the amount of digital information found in any frame of *Jurassic Park*.

In all, Boss would create 57 CGI effects for *Species*, four minutes of computer animation, as well as computer-composite 120 digital matte paintings. The three key personnel who helped guide Edlund through the digital realm were visual effects co-supervisor Jim Rygiel, who worked with Digital Productions on *The Last Starfighter*; Andre Bustanoby, who created the mechanical aspects of the puppet; and electronics supervisor Jeff Platt.

Before Phase Two could begin, a Boss Film sculpture of Sil was necessary. Edlund brought the sculpted cast to Viewpoint Data Labs in northern Utah to be scanned and digitized in 3-D to form the basis for the virtual creature. Once Sil was reconstructed digitally, it was time to make her move via motion capture. This is where Phase Two came into play. "There are several different methods of approaching this," begins Edlund. "The standard way is an optical approach where you use several video cameras set up in known positions that use multicolored light, or white light bounced off Scotchlite front-projection dots that have been placed on an actor. That, of course, is in real time, in that you can direct the actor moving around on the set. But the actual motion capture is later accomplished as a subsequent series of calculations.

Says Edlund, "In the case of Sil, she had to perform action that humans couldn't do. So we chose to go with a system that we've been developing for some time now, which is a real-time mo-

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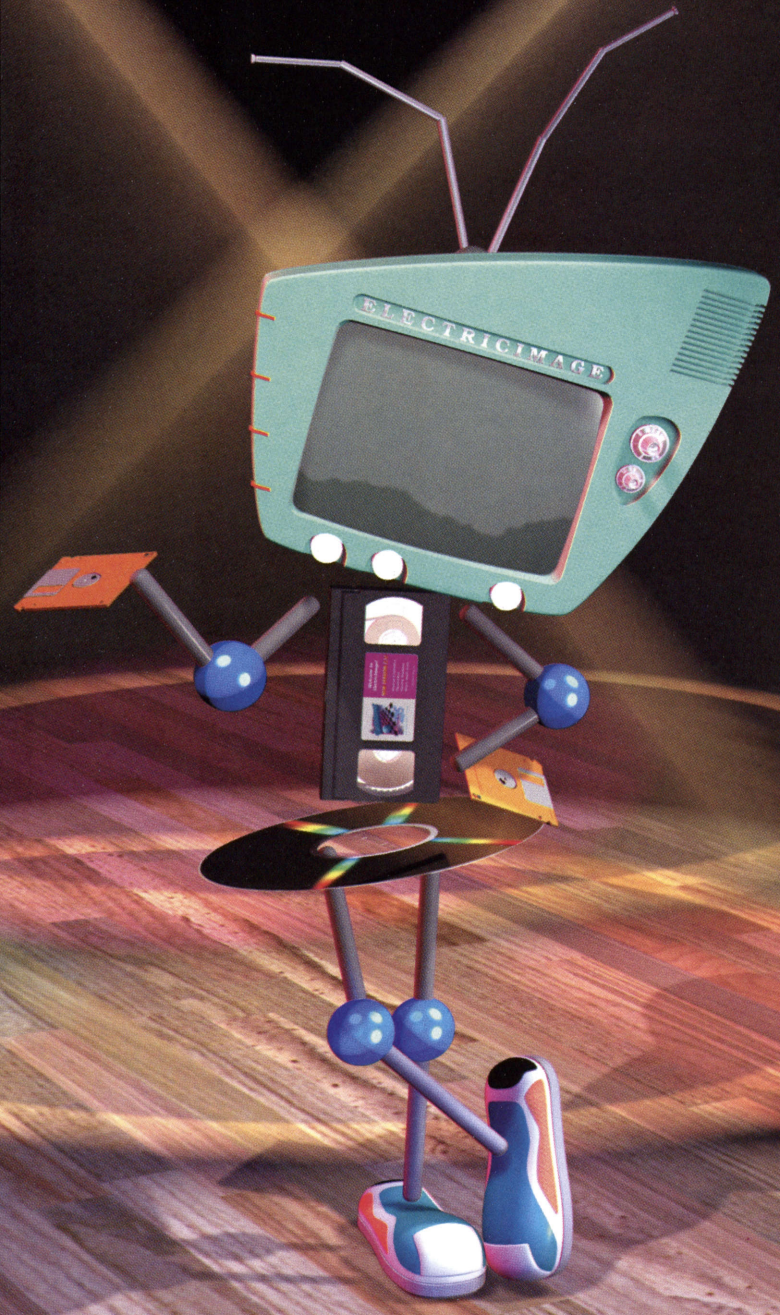

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tion capture puppet, [similar to] a rod puppet. It's a few feet tall with high-resolution potentiometers and optical encoders in all the bending areas — elbows, wrists, shoulders, backbone, legs, and so on. The motion that we capture is the 'directed action' that will then become the structure for the full-resolution [160,000 polygon] creature which will be created using CG."

The high-tech puppet was then attached to an overhead armature. Like a skeleton with transmitting sensors at every joint, it was manually manipulated by a team of puppeteers — or digiteers, as they like to be called — to do the cliff-edge to cliff-edge leaping required for the film's final sequence.

The puppet sends its movement and position information by means of resistance values encoding data to a Silicon Graphics Onyx supercomputer. This action is then "cybergraphed" by a virtual camera programmed to match the production camera's point of view. The high-speed Onyx instantly translates the puppet's movements into a detailed 45,000-polygon version of the creature in "real time," adding texture and facial features, and then digitally compositing her into the actual scene from the film. This image is actually low-res when compared to the final result, but enough for the director to view it.

The technique appears to be the evolution of the one Edlund devised to articulate the creature in *Alien*^{3} — though in that case, a realistic marionette was puppeteered against bluescreen, then composited with a laser disc image background for immediate playback and review. Here, the puppet is strictly used to provide the cyber-Sil with motion-capture information for her fully-digital performance.

This process allowed *Species* director Roger Donaldson to watch the composited scene on the monitor and actually direct the actions of the puppet as he would any actor. Even more extraordinary was that the motion-capture system allowed the visual effects team to achieve in one day what would have once taken as much as three weeks in the old chemical-optical world of visual effects. "The process is so facile that for one difficult shot, calling for the creature to jump and climb with amazing agility, we did 130 takes in one single afternoon!" Edlund says. "It is this kind of innovation that keeps me interested in the business of illusion. Audiences today are very smart; we have a responsibility to convince them that what they are seeing on the screen is indisputably real."

Boss was able to go in and tweak the action of the original motion capture if the director wanted to change something or blend parts of different takes together. "We can adjust motions and actions very easily, giving us incredible control," Edlund adds. "We capture the body motion in the first session and then we go back with the body motion that works and graft a face onto the body, also in real time. In other words, we add the face onto the creature, then animate the face with waldos."

When Boss eventually gets to Phases Three and Four of its development plan, the director will basically be able to talk to the puppeteers as though they were the actors. "Phase Four has to do with resolution and the ability to walk away with a very advanced digital video version of the day's work, and be able to cut it in on an Avid," Edlund predicts. "We're doing that now, but it takes a couple of extra steps."

"Mega City" Architects

Joel Hynek, Mass.Illusions and Kleiser-Walczak Construction Company combine to create an epic cityscape for *Judge Dredd*.

by Ron Magid

THE FUTURISTIC MEGALOPOLIS OF *Judge Dredd*, created at Cinergi's Massachusetts-based visual effects house, Mass.Illusions, was among the most impressive cinematic environments this year, greatly expanding the films live-action world, which was shot by cinematographer Adrian Biddle, ASC. The film's visual effects supervisor, Joel Hynek (*Predator*), used a variety of techniques ranging from large-scale miniatures to computer graphics to sell the reality of the future New York (aptly dubbed "Mega City") envisioned by visual effects production designer Robert Taylor. In the year 2139, much has changed in the Big Apple: for starters, the Statue of Liberty has been relocated to Times Square for security reasons!

Hynek took the unique approach of creating a database for every effects shot, beginning with storyboards and previsualizations. "Colin Green, who heads our previsualization department, was responsible for translating those shot designs into the database," Hynek says. "Everything was storyboarded on paper, then cut on an Avid. After that, we'd gradually take the static storyboards out and put in our moving wireframes as we did our pre-visualizations of what each shot would look like. Once the camera moves had been planned in pre-vis, that motion data was sent to our stage motion-control camera to shoot our miniatures. We used those shots as starters to give us something to look at onstage, then refined them from there."

Mass.Illusions created the establishing shots of Mega City seen at the beginning and end of the film by layering some sixty ⅛- and ¼-scale miniature buildings in the foreground, then filling any holes behind the miniature vista with more layers of computer-generated buildings. "We went whole-hog on models, figuring that was the most efficient way to create a vast city, although we did use CG to create the larger vistas," Hynek admits. "In the initial fly-over of Mega City, we created three foreground layers of model buildings, and then everything behind that was CG. We also layered CG buildings behind the foreground gradings of model buildings for the last vista shot of the movie. We could have used CG buildings in the foreground as well, but they would have required a lot more massaging. Since we used the same miniatures again and again in various shots, it was more efficient to do it physically."

But computers came to the rescue when the miniatures were being designed and built. By using Computer Assisted Design (CAD) to create blueprints, Mass.Illusions assembled a database from which either practical miniatures or a CG cityscape could be built. "Our designs were digitized in Softimage and in CAD," Hynek says. "Then the data could be fed to our computer-driven laser device, which cut all the pieces for each model. That way, our CG models would match exactly to our stage miniatures."

The power of CAD was fully demonstrated by the seamless marriage of sets depicting the lower 40' of Mega City, built on a London backlot, with miniature and CG buildings filling in the upper echelons. To convey the awe felt by Fergie (Rob Schneider) the first time he gazes upwards at Mega City's awesome towers, Hynek put a camera on a 60' motion-controlled ascender rig on the London backlot, then started the shot at street level and elevated the camera to the rig's full height. Mass.Illusion based their miniature buildings on a database of the lower stories of the set, and built their models to match exactly. "We then used the models to extend the buildings by translating the motion on the set to the motion-control camera move on our miniatures," Hynek explains. "My second, John Gaeta, supervised the shooting of the foregound models here at Mass.Illusions for the ascender shot."

After the models were shot, Hynek surveyed their positions using a high-tech laser transit, which created an instant 3-D layout of the miniature set. "The transit accurately measured how far away the models were from the camera and each other, then built a 3-D database right there on a little laptop," Hynek relates. "We theorized that if we built that 3-D database accurately enough, we could then create mattes from it rather than relying on photographic mattes or rotoscoping. The 3-D mattes we made from the database of the set — which we also surveyed with our laser transit — were so accurate that we didn't need conventional mattes. We also used 3-D mattes to add in our distant models, which we shot in a different scale on a different stage."

The final updated database was then translated into Softimage, and sent in that form to Kleiser-Walczak Construction Company, which created the CG signs, people and flying vehicles to complete the shot. "We used our updated environment database to digitally pepper those CG elements throughout the physical model as if they were part of the set," Hynek says proudly. "It's a very powerful tool."

Nowhere was Mega City shown off to better advantage than in the dizzying flying motorcycle chase involving Judge Dredd (Sylvester Stallone), Fergie and three would-be killers. Colin Green's pre-visualization of the sequence helped immeasurably in its planning, but even more important was some computer software he devised called the Extractor, which translated motion-control moves on the Mega City miniature to the flying motorcycle sitting on

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a hydraulic motion base in front of greenscreen.

Using more conventional methods, Stallone and Schneider would first have been shot on the full-scale bikes against greenscreen, after which the city models would have been tracked to their motion. But since it's easier to convince audiences that they're looking at Stallone on a full-scale bike than make them believe he's flying over a city, Hynek reasoned that the live-action bikes and the real-time motion-control camera should follow the moves on Mass.Illusions' models. "We wanted to involve the audience in the bike chase, not just plop them at the side of the road and let them watch, so we designed the sequence with the intent of shooting it from a 'camera bike' flying alongside our heroes," Hynek says. "The problem was how to shoot a greenscreen bike and make it fit into that background, given that we've designed the shot so that everything, including the camera, is flying down the street. The answer was Colin's Extractor program, which applied move-data from our miniature stage to the real-time Cooper motion-control system driving the motion-control camera and the hydraulic motion base beneath the full-scale bike sitting in front of greenscreen. We shot a lot of our moves on the models before we shot the greenscreen, which was very helpful in knowing how to light the bikes. Using the Extractor, everything moved in concert in real-time, based on either the actual model move or the pre-vis, so both the camera and the bike appear to be flying down the street."

Even with the Extractor, time, logistics and the sheer number of shots in the ambitious flying motorcycle chase sequence made it impossible for the production to film every cut with the actors live against greenscreen. The sequence boasts some very impressive coverage: despite the predominance of effects, Mass.Illusions was determined to enable *Dredd's* director, Danny Cannon, to cut the chase like a real action sequence. "We had three weeks to do about 50 shots in that sequence!" Hynek recalls. "Danny was generally trying to tell a story, and we were pushing him to shoot this sequence more like a ridefilm or a rollercoaster, where you involve the audience more than you can with just a film. Danny kept saying, 'I don't want this film to look as if the effects are driving it.' It's unavoidable in a sequence like that where you see flying bikes over a futuristic city, but thank God for suspension of disbelief!"

The high number of shots — coupled with extreme perspective changes as the camera veered into and then away from the bikes — made it impossible to choreograph the movement of the camera on the greenscreen stage to the movements of the models. Hynek asked the husband-and-wife team of Jeff Kleiser and Diana Walczak, the people who coined the term Synthespians, to create synthetic stunt doubles riding CG flying motorcycles that careened in and out of the huge ¼-scale miniature buildings. "We started out by laser-scanning Stallone and Schneider's heads with the Cyberscan device," says Jeff Kleiser. "Then Diana sculpted half-sized bodies of Stallone, Schneider and the would-be killers because the scanner can't do a whole body — yet. After the bodies were scanned by Cyberware, we then grafted the heads onto the bodies in the computer system using new Wavefront Technology software made especially for this project."

Kleiser-Walczak used the Flock of Birds motion-capture device to gather data from Stallone, Schneider and the three stuntmen playing the evil Judge-hunters on a mockup of the motorcycle mounted on a gimble. "We rocked the bike in-sync with our edited laserdisc pre-visualization of the sequence, which showed a low-res version of the bikes flying through CG wireframe mockups of model buildings," Kleiser explains. "That way, we could copy the camera moves on the miniature city while capturing the appropriate degree of leaning on the bike to give our synthetic characters humanlike motion. Then we translated the motion-capture data into CG models of the bikes and actors, which we digitally composited over the miniature city."

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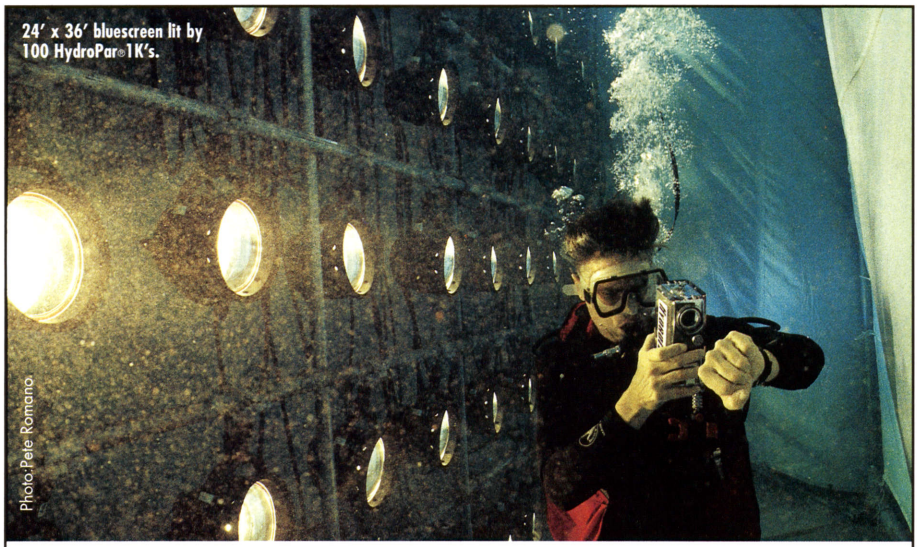

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Kleiser-Walczak's effects artists were worried when their CG motorcycles and Synthespians had to veer very close to camera. "At the outset of the project, we were leery about just how close we could get to our synthetic figures and still have the quality hold up," Kleiser admits. "We were pleased to see that even shots where our CG bikes filled half the screen height — not a close-up, but pretty close — worked. Those shots were helped by some new software we developed to simulate motion blur; when the bikes raced by camera, they streaked. The effect made them look more natural and tended to hide any embarrassing detail problems."

As a final touch, Kleiser-Walczak augmented the city itself with motion-capture citizens as well as 80' holographic mega-droid characters on billboards. "We couldn't shoot actors against greenscreen with match-moves because the camera was flying through this model city," Kleiser explains. "In order to shoot a real person at that scale, with the appropriate perspective changes on them to match the flying move, we'd have to have a motion-control rig a couple of miles long. Instead, we added synthetic people — walking around on balconies, on rooftops and in windows — to our models. And because we had this precise registration between the motion-control camera shooting models and the motion-capture equipment, the alignment was almost perfect. The best models without anything happening in them look dead; populating the model city with humanlike characters gave it much more scale, which really knocks people's socks off."

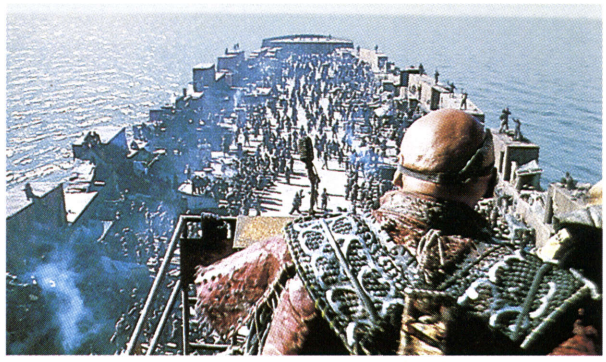
Even though *Judge Dredd* failed to find an audience, Joel Hynek, Mass.Illusions and Kleiser-Walczak Construction Company succeeded in creating a brilliant futuristic megalopolis. "Our goal was to validate the movie by validating the environment," Hynek says with a sigh. "We really tried our darnedest to push that old envelope and give everybody a good ride."

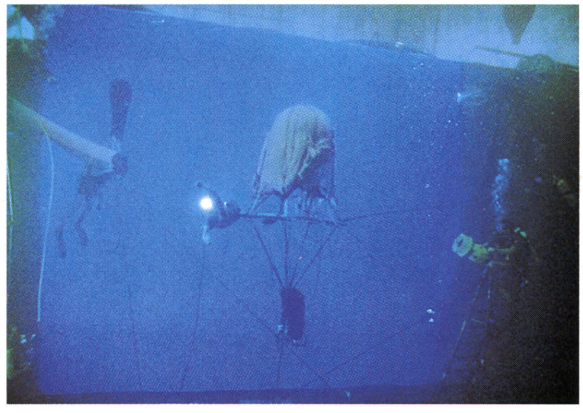
Taking the Plunge on *Waterworld*

Visual effects supervisor Michael McAlister marshals a team of effects experts to create daring seascapes for epic sci-fi adventure.

by Ron Magid

OUTER SPACE HAS BEEN DEEMED THE final frontier, but we know more about the cosmos than we do about inner space: the oceans of our own Earth represent virtually the last opportunity on this planet to explore the unknown. In many ways, the depths of the waters covering 60 percent of our world are more fascinating than the far reaches of the solar system. Why then, in the history of the cinema, have only a handful of films ever dared to journey into this realm? Because it's extremely difficult to shoot on water, to work with water, and, heaven forbid, create effects on water. Since *Waterworld* proposed to deep-six our entire planet, it should come as no surprise that it became the most expensive movie ever made.





Top pair: ***The Deacon (Dennis Hopper) addresses his horde aboard the land-locked*** **Valdez** ***set built in the City of Commerce. Blue material provided an edge to facilitate Cinecite and Arete's digital ocean composite.*** **Bottom pair:** ***The Mariner (Kevin Costner) and Helen (Jeanne Tripplehorn) investigate the sunken city of Denver. The underwater bluescreen photography was a first, later melded with dry-for-wet passes of Denver and CG water-borne particles, bubbles and flare effects.***

Photos courtesy of Cinesite and Universal City Studios

Michael McAlister, the visual effects supervisor on Universal's controversial mega-production, first confronted the problems inherent in mixing water and effects while working with Dennis Muren as chief effects cameraman on *Indiana Jones and the Temple of Doom* at Industrial Light & Magic. While at ILM, McAlister proved himself indispensable, the man who could figure out virtually any mechanical effects problem — from the speeder bike chase of *Return of the Jedi* to the mine chase of *Temple of Doom* (he actually modified the Nikon still camera that rode on the miniature mine track in that sequence). In recent years, McAlister's effects filmography has ranged from the spectacular (*Die Hard 2*) to the elegant (*The Hudsucker Proxy*) to the invisible (*Wrestling Ernest Hemingway*). So what prepared him for the effects tsunami he was about to face on *Waterworld*? "Just my entire career!" he quips.

Like most effects artists, McAlister has moved away from the confining equipment-intensive approaches of motion control and towards the freedom of digital solutions. "The thing that most excited me about working on *Waterworld* was that it was really the first opportunity to deal with what has been historically a very formidable problem, miniatures in water, using the new digital tools. The computer has given us a lot more freedom to be creative on the set — there's virtually nothing we can't do anymore."

The approach McAlister formulated towards *Waterworld*'s monumental effects challenges would put that adage to the test. McAlister and visual effects producer Kimberly Nelson originally

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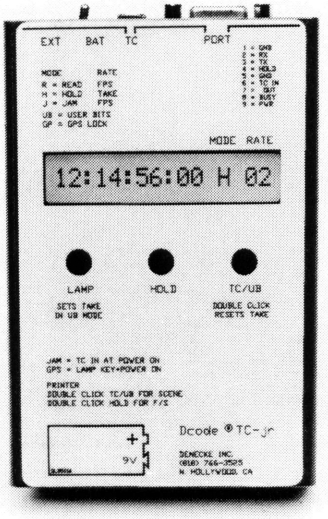

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distributed some half-dozen unique effects sequences among three effects houses. Specific CG characters and objects were assigned to digital experts Rhythm and Hues and Boss Film (also profiled in this issue's article on *Species*). The latter facility created a CG balloon hovering over the gondola piloted by Gregor, the scientist/inventor played by Michael Jeter. Rhythm and Hues handled a similar effect, creating a CG spinnaker box kite that deploys from the Mariner's trimaran — a three-hulled catamaran — so he can escape from his enemies. McAlister also chose Rhythm and Hues to handle all of *Waterworld*'s 3-D character generation, including denizens of the deep like the Tracker Sharks, which the film's villain unleashes to locate the Mariner after his escape in the kite. McAlister found the Tracker Sharks (later cut from the film) more problematic than the fictitious Whalefin, an unpleasant cross between a whale and a shark, which the Mariner catches for dinner! But the bulk of the work was awarded to Cinesite, which had previously handled such diverse tasks as digitally restoring Disney's animated classic *Snow White* and creating period effects for Woody Allen's *Bullets Over Broadway*.

But as the *Waterworld* production shot and shot and shot on the atoll set they'd built on the ocean off Hawaii (see *AC's* August coverage), the number of effects skyrocketed from a modest preproduction estimate of 160 to a staggering final total exceeding 400 shots, which necessitated bringing in many more effects houses to process all the work. "We had to go to 10 or 11 facilities just to get the show done," McAlister admits. "There's no way I could have done this movie without digital power and multiple facilities. Part of the challenge of *Waterworld*, above and beyond all the creative and technical aspects, was just getting the job done."

The first major hurdle for McAlister and company to overcome had to do with creating villain Dennis Hopper's hideout aboard the infamous *Exxon Valdez* supertanker. The 600-foot stem-to-stern set was itself a miniature (the real tanker measures 900') and was constructed *outdoors* in Southern California's City of Commerce. With mountains and telephone poles clearly visible in the background, handling what Cinesite's crew called "sky-garbage removal" stress-tested their digital technology. "We didn't bother to put up any screens — nothing," McAllister insists. "After the fact, we took out all evidence of the City of Commerce; you'll believe that the entire third act of *Waterworld* was filmed someplace completely different."

Creating the CG water surrounding the land-locked *Valdez* set and stretching to the horizon required a collaboration between Jerry Tessendorf of Arete, the company that wrote the computer code for water, and Cinesite digital effects supervisor Jamie Price and senior digital effects supervisor Brad Kuehn. "There's a lot of things that go into water, certain repetitious patterns in the waves, which at first I didn't like," says Kuehn. "Then I realized that water's more boring-looking than I thought!"

Defining the final look of the ocean took several months. And since nothing was ever easy on *Waterworld*, those shots of the 600' set surrounded by CG water had to intercut exactly with longer shots of a ⅛-scale model of the *Valdez* surrounded by real water plates! The *Valdez* miniature — constructed by Mark Stetson, Bob Spurlock and crew at Stetson Visual Services — measured 110' from stem to stern, which led Stetson to observe that had it been seaworthy, the *Valdez* model would've been classified as a ship, not a boat!

Ironically, after completing *Waterworld*'s miniatures, Stetson Visual Services closed their doors forever. As proof that there is life after *Waterworld*, Mark Stetson has landed at Digital Domain as a visual effects supervisor. No doubt he's prepared for anything after assisting McAlister in creating the film's most challenging effects sequence, in which the Mariner tows a diving bell containing Jeanne Tripplehorn through the submerged remains of Denver, Colorado.

Prior to creating the scene, McAlister studied books on the Titanic and other naval disasters, as well as underwater footage shot by Stetson, whose company also constructed a huge miniature depicting the undersea wreckage. "The whole point of the city," McAlister relates, "was to illustrate what had happened to the human race — to convey the desperation that occurred as the [people had moved] higher and higher above ground, building abodes on top of rooftops as the water level rose. We wanted to show the decay — it's a ghost town." Amidst the remains of Denver's downtown district and shattered ski-lifts, the modelmakers also planted dozens of homages to past aquatic film adventures — including the sunken boat *Orca* from *Jaws* and a submersible from *The Abyss*.

To make the heroes' tour of the undersea city haunting, romantic and believable, McAlister insisted that the actors really had to be swimming in water with the city around them. Aside from building a full-sized re-creation of Denver and submerging it, McAlister knew of only one way to get the shots he wanted: filming Costner towing Tripplehorn in the diving bell against a massive underwater bluescreen. Great idea, but the hitch was that it had never been done before. For a shot in *The Abyss*, director James Cameron had filmed Mary Elizabeth Mastrantonio in close-up, with a bluescreen behind a windowed tank, but McAlister thought that would prove too confining for the scope he had in mind. "I wanted a 20' x 30' bluescreen down there," McAlister explains. "Where were we going to find a windowed tank that could hold 30 feet of water?

"I knew we had to film this scene underwater as opposed to in a smoky soundstage because of the lighting and the amount of minutiae in the water [required to make] it seem as if they were actually swimming through a scene, as opposed to floating through air. And there was no backup plan! There was no way to test it except to go do it and spend a lot of money with the principal actors shooting underwater. If it had failed, our only option would have

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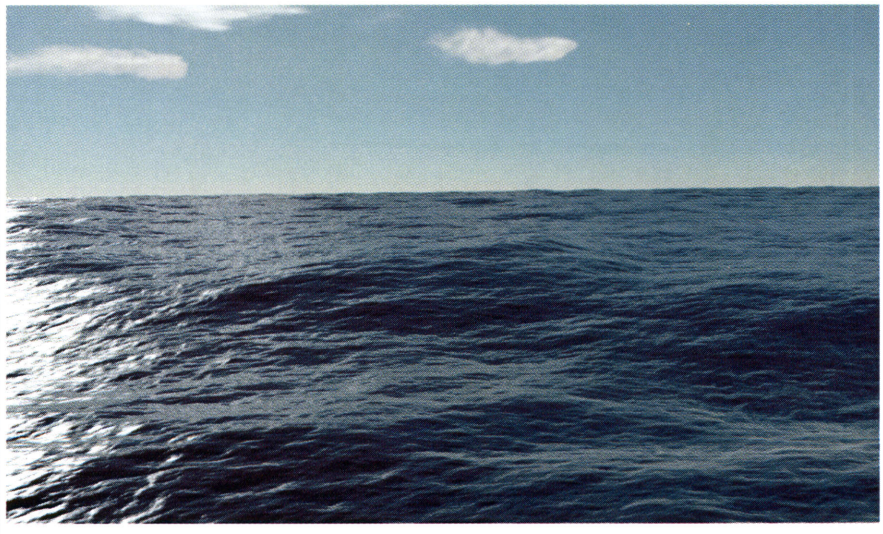

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been to quietly disappear from the planet and not leave any forwarding address!"

Fortunately, McAlister was working with Brad Kuehn, who had some unorthodox ideas of his own about shooting underwater bluescreen, especially in relation to particles in the water. "I was there when Mike shot some motion tests at USC's pool with a bluescreen underneath the water," Kuehn recalls. "We were both concerned about this dirty water in the pool contaminating the blue, but then we both got the idea that the dirty water might help us more than hurt us, because having these particles moving around the Mariner really gave us a sense of the volume of water this guy's existing in.

"So we told Mike, 'When you shoot this underwater bluescreen, contaminate the water — we think it'll work!'" Kuehn laughs. "It was a challenge, but we felt that with digital technology today, we had all the tools to make the Mariner look as if he were swimming through this underwater city. To make it look submerged, Stetson actually shot dry-for-wet with two passes of clean background plate and a smoke pass."

"Technically and creatively, that was the biggest leap I had to make in terms of the digital technology on *Waterworld*," McAlister says. McAlister knew that lighting was a key cue in creating the underwater look. In front of the underwater bluescreen, Costner carried a bare lightbulb (which was later made to look like a flare with the help of CG). "The flare was a design decision about where the lighting in the city was going to come from," McAlister relates. "As it turned out, it didn't serve as the key light source, but it does help us feel as if we're underwater because as the Mariner swims away, these flares get less and less red, which adds a certain element of reality. If you go underwater with a real camera, you see 30' in front of your face. If you go down 600', which is where our city's supposed to be, there is no light, so we had to invent a whole look that wasn't real, but looked real and still gave us enough visibility."

At Cinesite, Kuehn, Price and company combined Stetson's miniature passes with McAlister's underwater bluescreen footage, composed by cinematographer Dean Semler, ACS and photographed by underwater expert Pete Romano from Hydroflex. "After we got Costner in the scene and saw how that worked, we augmented it with CG minutiae to add layers and depth," Kuehn says. "We then added the Mariner's CG flares and layers of CG bubbles coming off the flares."

Like everything in *Waterworld*, it seems, this sequence was a make-or-break moment. "Yeah," McAlister sighs, "it had to work. Fortunately, we made some pretty good choices in the beginning, testing as much as we could, and we were able to get guys like Brad at Cinesite in line with us to say, 'Yeah, we think we can do it — we don't know how yet but we'll do it.' And then we just had to go for it, because otherwise the technology and the art of the industry never advances. There were some people out there who thought I was crazy, friends who shook their heads and said, 'I'm glad it's you and not me,' but that's what makes it fun. If you don't hang it out on the edge once in awhile, you get bored."

Congo Goes with the Flow

ILM's alchemists come up with a new mixture for molten lava to enhance adventure film's climactic volcanic eruption.

by Ron Magid

Congo, based on Michael Crichton's bestseller about mutant, cannibalistic apes in deepest, darkest Africa, has all the familiar trappings of an *Indiana Jones* serial-type adventure. *Congo* is filled with lost cities, mysterious hieroglyphics, hidden mines, and a volcano threatening to erupt at any moment. "It's really a Forties-style picture," admits Industrial Light & Magic visual effects supervisor Scott Farrar, "where the heroes fly into the jungle to try to steal the jewel from the stone god, and the natives are restless."

ILM has enjoyed a legendary association with *Congo's* author, Michael Crichton, most recently on the dinosaur epic *Jurassic Park*, and Scott Farrar has a longstanding relationship with *Congo's* director, Frank Marshall, having helmed ILM's effects for *Alive*. But on *Congo*, Marshall and Farrar were about to tackle some of the most challenging effects they'd attempted since *Jurassic Park*'s galimimus stampede, on a very tight schedule. "This is the busiest show I've been on ever," Farrar sighs. "We had three camera crews running at the same time, shooting new effects elements as we were assembling our shots. We had to get everything through the pipeline just as fast as possible."

Much of ILM's work consisted of expanding the scope of the picture by adding height, width and depth to the soundstage-bound exterior sets of the lost city of Zinj, photographed by cinematographer Allen Daviau, ASC. Experimentation and the mixing of effects technologies, coupled with a demanding, photo-realistic approach, were key to the success of *Congo*'s eye-popping imagery. "The goal has always been to make our work as realistic as possible," Farrar says, "not movie-real but National Geographic real."

Photos by Sean Casey, courtesy of Industrial Light & Magic

Above: ***The film's effects unit shoots footage of an elaborate miniature jungle set.*** **Left:** ***An impressive composite shot of "lava" erupting from an active volcano.***

In *Congo*'s explosive climax, an underground implosion triggers a volcanic eruption out of the side of Mount Makenko, overlooking the lost city of Zinj. Rather than creating a miniature reproduction of the entire Mount Makenko (actually a mountain in Costa Rica), ILM's model shop built just the imploding section in ⅛ scale, then grafted that 8' x 10' postage stamp-shaped portion onto the real mountainside using CG. "The initial blast was done practically, powered by tiny textural dust propelled from air cannons," Farrar says. "We used air pressure and mechanical devices to blast the hole out, along with lots of micro-balloon small dust surface textures. Lorne Peterson and all the

people in the model shop came up with special recipes for how the crust should fall away and crack and crumble and turn to dust. It's fairly exotic."

As the miniature mountain blew, effects cinematographer John Fante pushed the art of overcranking to his cameras' physical limits. "When we're blowing up a miniature mountain, our cameras can't go fast enough," Farrar confides. "John had to run his cameras at surprisingly high film speeds, well over 300 frames per second, to make our miniature shots work."

Finally, the 8' x 10' implosion element was photo-appliquéd into a background plate of the actual mountain. A variety of techniques, some new, some old, were used to create the realistic venting of ash and cloudy plumes of smoke.

After the mountain blows and the smoke billows, the lava flows, filling King Solomon's subterranean mines and destroying Zinj. It was an ending Farrar and his ILM cohorts feared, knowing they'd have to tackle a problem that has plagued effects artists for generations: molten lava. "We kept asking [mechanical set effects supervisor] Michael Lantieri if he thought he could pour lava on-set and make it look real. He just laughed and said, 'Do you know how many dumptruck loads of lava you'd need to do that?'"

Realizing that the lava was soon going to land in their laps, Farrar's ILM team began investigating their options. After viewing every movie ever made with even a hint of molten magma, Farrar and art director Claudia Mullaly determined that one of the most convincing films to "go with the flow" was *The Devil at 4 O'clock*, a 1961 Columbia picture with Spencer Tracy and Frank Sinatra, shot by Joseph Biroc, ASC with special effects by Willis Cook. But while the ILMers were impressed by Cook's excellent large-scale mountain explosions, the lava effects themselves still owed a large debt to Quaker Oats. In fact, low- or high-budget, there's almost never been a successful lava flow in a movie except for the real thing; in general, "lava" has always looked exactly like what it is: warmed-over oatmeal with food coloring! "That's how they tell you to do it in the special effects books: just put food coloring in oatmeal, add some little flaming embers and pour it," Farrar notes with a laugh.

The best lava recipe Farrar found was that pioneered by Dennis Muren and ILM for *Indiana Jones and the Temple of Doom*. Muren illuminated methylcellulose, a thickener found in McDonald's milkshakes, using colored light from below, which gave the lava an internally lit look but didn't allow for color control.

Farrar's team then started experimenting. "We used a lot of different colored materials," Farrar recounts with a grin. "We poured red stuff, we poured green stuff, we poured blue stuff — every color there is — and computer graphics supervisor Sandy Karpman played with the matting. Our original thesis was to actually use a color of red that was closest to the lava color, which would hopefully get us that much closer to replicating the real look."

"When we're blowing up a miniature mountain, our cameras can't go fast enough."
— Scott Farrar

Ultimately, after a series of fruitless tests, Farrar resorted to the same material Muren used, but took advantage of the latest digital technology to paint the thick white liquid the ideal color, texture and luminosity of lava in ILM's computers.

Rather than pouring dumptruck-sized loads of methylcel over their sets, Farrar came up with a system whereby the actors and/or apes were first filmed on-set, minus the lava. Next, the white methylcel lava, mixed with a variety of gray pigments to create "striations," was poured over exact miniature reproductions of the full-sized sets, after which the elements were composited together digitally. "Our model-shop people went on-set and measured everything," Farrar explains. "Then they rebuilt the entire set in miniature at ILM, biasing the scale to a certain size that worked properly with the methylcel lava, and painted the miniature blue. A big problem with the pouring of our lava flow was that the methylcel-based white material usually thinned out right away, so we had to blend in something to keep it thick while also dealing with interactive materials like moving rocks or crust. Consequently, we'd do many pours per setup. Sometimes the crust rolled off our lava, so we had to devise crust delivery systems to make it stay on the moving methylcel flow for the entire shot."

Although the film's heroes appeared to be chased by tons of vanilla ice cream in the rough composites, Farrar's solution was a clever one. "The blue miniature sets enabled us to pull mattes easily," Farrar says proudly. "Then we colorized the white methylcel in the computer and added all these different layers of flaming debris and smoke and heat ripples and ash, depending on the type of lava flow we needed. We divvied it up into what we called our 'gray versions': bubbling, boiling lava with spurts and globs shooting out, breaking the crust, which was seen in the implosion area the first time there was major volcanic activity. Then we had our 'red section,' those classic lava shooters that exploded out of the mountain peak, which we assembled out of in-camera components and elements we composited in after the fact. Sometimes we'd get our colors wrong, so we just kept having to finesse the striations and textures, but in the end, both styles of lava looked great."

The experimental effects technology, the vast amount of work and a tight delivery schedule took its toll as Farrar and his crew white-knuckled it toward *Congo's* finish line. "This movie was like a gigantic art project for us," Farrar laughs. "It was one experiment after another for practically every sequence. Our motto, since we had a ton of work to do and a very tough schedule, was, 'Go really fast and don't forget anything!'"

Adding Punch to *Mortal Kombat*

Digital wizards add visual opulence to the film version of blockbuster videogame.

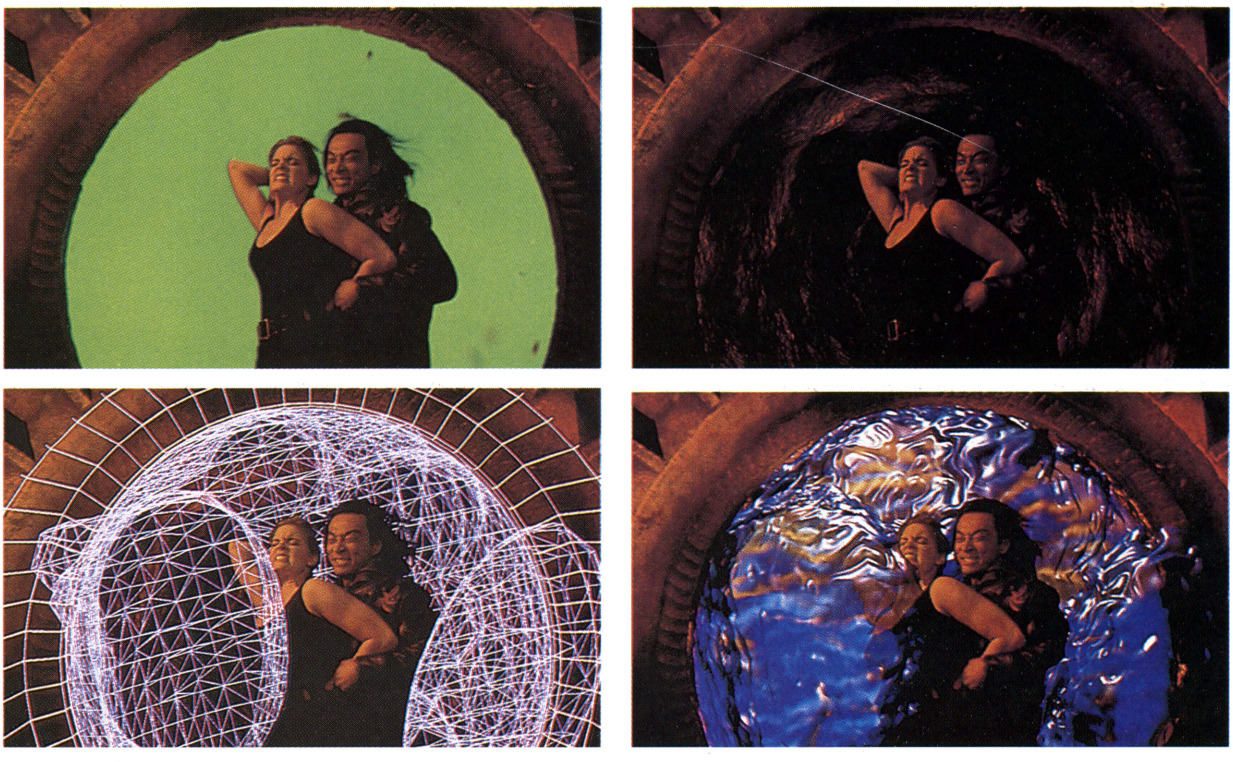
by Ron Magid

THE TITLE OF THE SUPERCHARGED videogame Mortal Kombat refers to a no-holds-barred, blood-and-guts Battle Royale that pits the violent exploits of the universe's greatest warriors against the soul-stealing supervillains of Outworld. But muscle of a different sort was required to translate that RAM-driven universe to the analog realm of blockbuster cinematic entertainment.

Director Paul Anderson, producer Larry Kasanoff and associate producer/visual effects supervisor Alison Savitch insisted on filling every frame of the *Mortal Kombat* movie with a variety of eye-popping effects, using virtually every technique in the book. But creating astounding visuals is usually the province of films with larger budgets and much longer incubation periods. Despite its relatively meager $30 million budget, *Mortal Kombat* boasts a whopping 200 digital shots, most of which were completed during the few months between the end of production and the film's release. "Every effect was completely different," says Savitch, whose credits include *Bram Stoker's Dracula* and *The Shadow*. "The whole concept of the movie was to create the coolest visual effects on an extremely tight time frame, so the minute they finished a shot, I'd try to get the sequence cut and get it into our effects facilities. We'd turn around a completely computer-generated 3-D shot in a couple weeks, which is unheard-of, but we had an amazing team of people."

Facilities as diverse as Amalgamated Dynamics, Available Light Limited, R&B Films, Todd-AO Digital Images, Fantasy II Film Effects, Illusion Arts, The Post Group, Viewpoint and Pacific Title Digital Studios International rounded out the visual effects crew. But the lion's share of the work was spearheaded by Disney's in-house effects outfit, Buena Vista Visual Effects, whose wizards created most of *Mortal Kombat's* extraordinary environments, and R/Greenberg Associates West, who animated or augmented the evil denizens of Outworld, including sorcerer Shang Tsung's unholy trinity of henchmen: the chilling Sub-Zero, the whiplike Scorpion and the inhuman Reptile. The resulting work made *Mortal Kombat* the most successful videogame-to-film transfer yet.

Despite the freedom and ease that computers have brought to the effects field, digitally compositing even the simplest shots became quite an elaborate process on *Mortal Kombat*. Pacific Title Digital Studios International was originally hired not to perform digital compositing, but to scan the majority of R/Greenberg Associates' CG elements and to execute painstaking wire removal throughout. Nevertheless, Pacific Title ended up compositing a number of shots when the going got tough,



Film clips courtesy Buena Vista Visual Effects

Vicious sorcerer Shang Tsung (Cary-Hiroyuki Tagawa) drags Kombat-participant Sonya Blade (Brigitte Wilson) through a viscous portal to Outworld. The modestly-budgeted production utilized CG to greatly enhance every aspect of its Asian-flavored fantasy world.

including several involving the four-armed behemoth called Goro, created by mechanical makeup maestros Tom Woodruff and Alec Gillis of Amalgamated Dynamics (*Alien*^{3}). While two of the musclebound gladiator's four arms belonged to the actor wearing the suit, the other pair was articulated via rods puppetted on stage — and had to be removed in every composite.

Among the most complex composites Pacific Title handled was the sequence in which Goro falls to his death off a cliff, plunging through the clouds filling the abyss below. R/GA supervised the greenscreen plates of the Goro character hanging off a large cliff set, and did a previsualization of the comp at a video house. "We then scanned R/GA's elements in at high resolution," explains Pacific Title's executive producer, Joe Gareri. "Even though this particular comp appeared to consist of only two layers — Goro on the cliff against greenscreen and the cloud background — we had to do a pass to add interactive lighting on the character, another layer of smoke, and so on. By the time we were through, this simple comp involved six to eight layers."

Gerari stresses that there's an art to compositing: even in this digital age you can't simply tell the computer to lay one element over another, then go home. "I wish it was that easy!" Gerari chuckles. "After we removed the rods on Goro's arms and any contamination in the green background so we got a nice key, we realized that the foreground rock setpiece was shaking, which would have made the shot look a little artificial. We had to stabilize the rock before we could do our composite."

Pacific Title used several layers of stock-footage clouds to create the background plate of the cloud-filled abyss. "We repeated and positioned these oscillating clouds so it looked as if we had more of them," Gerari reveals. "Also, the clouds we liked didn't have the lightning flash we wanted, so we superimposed another section of the neg that had the flash over the scene, which made the chasm more mysterious. Then we positioned the overhead greenscreen plate, of Goro appearing to fall, over our cloud plate, and reduced him so that he fell into these moving clouds in the abyss below."

The creation of the rest of Outworld's bizarre locales was overseen by Buena Vista Visual Effects Supervisor Peter Montgomery. By augmenting sets and locations with computer graphics and digital mattes, Montgomery's team gave *Mortal Kombat* tremendous scope worthy of a much more expensive film. "It wasn't a low-budget feature," Montgomery points out, "but people don't make movies this big for the amount of money we had without tremendous amounts of effort from a lot of people. My effects producer, Caroline Soper, and I decided not to take on a bigger portion of the show, which was our own little trick to ensure that we were happy with our work."

Though *Mortal Kombat* was Montgomery and Soper's last film for Buena Vista — they're now finishing up shots on *When Nature Calls*, the sequel to *Ace Ventura, Pet Detective* — they gave it their all, creating effects for upwards of 30 shots. While most of their work involved scene environs, they also built the eerie Dragon Wing ghost ship, which conveys the Mortal Kombat tournament contestants to Shang Tsung's island, entirely in the computer. "We looked for junks and never found what we wanted," Savitch recalls. "It had to be this fierce, horrific vessel that Shang Tsung had summoned from the depths of Outworld, with cloth and sludge dripping off it. We found junks that were pristine, but their owners wouldn't let us destroy them; we found others that were run-down but not big enough. And even if we'd found the perfect one, we then would have had to erect a huge greenscreen behind it for the transition sequence from the real world to Outworld."

But Savitch knew they could get exactly the look they wanted by creating the ghost ship in the computer. She had the production's art department draft some exciting designs, then gave them to Buena Vista. "The art department's designs were interesting, but nothing we could model from," Montgomery says, "so Sam Mitchlap did a lot of design work on his own. He incorporated elements of Chinese junks and Viking ships, then literally drew up a set of blueprints which he handed to Aaron Campbell, who modelled the boat and all its tattered sails. Then Lee Megyer rendered it and really massaged the hell out of every shot he composited the ghost ship in. For example, when the ghost ship came into port, it was supposed to generate its own fog: Lee rendered that boat in three separate pieces so when it came out of the fog, we could control the density and make the back end foggier than the front."

After our heroes Liu Kang, Johnny Cage and Sonya Blade reached Outworld, Mortal Kombat arenas as diverse as Shang Tsung's sculpture garden or the deepest dungeons of the Black Tower were created through a clever combination of elaborately-constructed sets and real locations in Thailand. Those settings were then augmented in imaginative ways by Buena Vista's 20-odd matte shots. Even the rounded hills on the peninsula near Krabi, a town on the Thai coast, were digitally altered into the sharp foreboding peaks of Shang Tsung's island fortress, via 2-D matte paintings. "We shot that plate in Thailand from the deck of a two-story boat bobbing off the coast as these longtail boats come out to meet the Ghost Ship," Montgomery recalls. "After we stabilized the plate, matte artist Paul Lasaine (*Dick Tracy*) created a matte painting that transformed the landscape; then we simply inverted the bobbing movement of the plate back on top of the locked-off plate. But they decided to get even trickier and add a pan to it! As a result, we had to extend this pretend-lock-off plate by flopping the water and sky in the plate and putting it back in. We strategically positioned our CG ghost ship so it covered and extended the right edge of frame, and then added the pan back in."

Buena Vista Visual Effects also transformed the set of Shang

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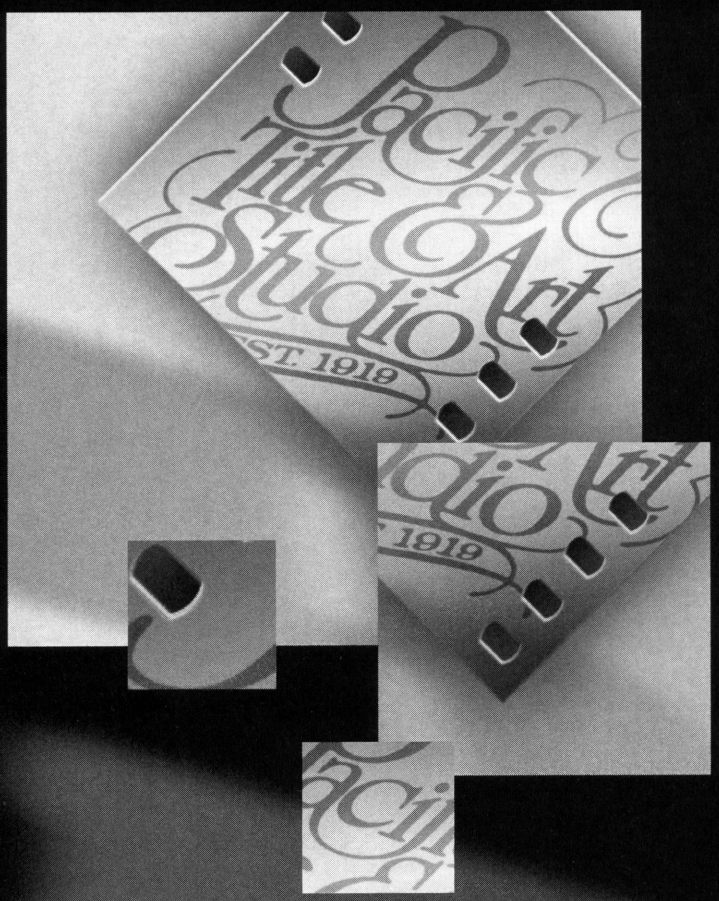

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Tsung's statuary garden into one of the film's outstanding visuals. The garden set consisted of a slender strip surrounded by sculpted green foam statues, through which the actors walked. "When the budget became reality, the 300' by 300' set the production designer wanted to build got scaled back into something a lot smaller, built inside a small hangar at Santa Monica Airport," Montgomery says. "We did a little bit of forced perspective onset by throwing the larger statues close to camera and the smaller ones in the distance, just to emphasize the scale. Then we shot the actors walking into the statuary garden locked-off with a wide-angle lens, strongly backlit."

Montgomery and company then set about creating the rest of the environment — hundreds of stalagtites and stalagmites and many colored windows — using a conventional approach and a lot of imagination: "Paul Lasaine executed a terrific matte painting on masonite using conventional paint. After we scanned that element in, he did his final hookups, touchup and blends, including adding the lens distortion and the big shaft of light, in the computer. Then Wally Schaab, who composited it, transformed Paul's cavern painting into a synthetic multi-plane shot by cutting it into little layers. Since our CG system was designed to interface with Disney's feature animation department, we could simulate multiplanes, which created a tremendous sense of depth. Wally finished the statuary garden off by adding two synthetic waterfalls, some atmospheric haze and about 8,000 torches he stole from the Outworld exterior and made into a 24-frame cycle loop! For the final touch, we created this massive synthetic tilt-down from the top of the cavern to our heroes, which jacked up the production values about a billion percent. It was a really big-looking shot."

Another environment created with 2-D matte paintings was the arrival of Liu Kang and Johnny Cage in Outworld. "The camera dollies around them, cranes up, then tilts up to reveal this huge roadway lined with grotesque statues and this weird Black Tower in the distance," Montgomery says. "On the left side of the original plate was the Fontana steelworks, and on the right was a fence, and the director wanted to create this giant dolly-crane-tilt shot and have us do a matte painting to match! It was the kind of shot we normally say no to, because there's not much perspective change in a 2-D matte painting. I was able to deliver a solution by carefully breaking the shot down to create the illusion that we're always panning, tilting and craning. Once they gave us a plate we could actually track a 2-D matte painting into, we sliced the painting up into a couple of layers to allow for all the synthetic perspective changes. After we got the tracking worked out, we stole the fire elements from the left side of the plate and introduced them on the right side."

But Buena Vista didn't do everything with 2-D mattes. A mindbending fly-through of the caverns of Outworld and into the Black Tower used 3-D CG to provide awesome scope. The craggy Black Tower itself, with its threatening gargoylesque doorway, was created using three-dimensional wireframes covered with realistic stone texture maps; as the camera moved freely around the CG "structure," it appeared to change perspective. "That entire sequence was built in the computer, completely in 3-D, by Buena Vista," Savitch proclaims. "Their computer-generated environment encompassed a ten-mile stretch with thousands of caverns! We could not possibly create that in miniature, not even a forced-perspective miniature, without spending a ridiculous amount of money — and that was only one shot! Of course, once that environment was built, we did a lot with it."

The endless imagination displayed by *Mortal Kombat*'s army of effects artists produced visual opulence on a budget. And Alison Savitch is justifiably proud of their work: "Overall, I think we accomplished a huge amount in a very short period of time."

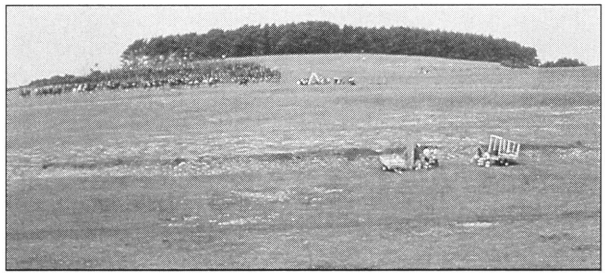
Braveheart Effects Team Adds Scottish Brogue to Blarney

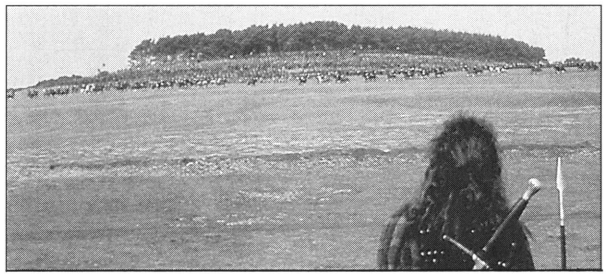
R/Greenberg Associates transforms modern-day Ireland into Scotland for rousing historical adventure film.

by Ron Magid

IN THIS AGE OF DIGITAL MAGIC, THE removal of telephone wires and other modern ephemera cluttering the landscape is commonplace. But rarely has such high-technology been used to recreate the distant past with absolute historical realism, as in Mel Gibson's Scottish epic, *Braveheart* — filmed entirely on location in Ireland!

Transforming present-day Ireland into ancient Scotland was just one of dozens of headaches conquered not only by cinematographer John Toll, ASC, but also by





Braveheart visual effects supervisor Mike Fink (*Batman Returns*) and visual effects producer Tricia Ashford at R/Greenberg Associates' LA office. Besides removing countless telephone wires, R/GA also digitally expunged a 747 that unexpectedly flew through a very long dialogue sequence in which William Wallace (Gibson) first pledges his support to Robert the Bruce if he can unite Scotland. "We like to call that type of thing '7-Eleven removal,'" Ashford says with a grin. "It's for when the production finds a wonderful location and there's a 7-Eleven smack in the middle of it."

R/GA created many digital matte paintings to put reflections in the water, change the lighting, or just make Ireland's castles a wee bit more Scottish. Fink and Ashford even brought the Highlands to Ireland for the film's final shot, in which Robert the Bruce at last unites the Scots at Branning Burn, with its backdrop of rolling hills. Recalls Ashford, "We added the Scottish Highlands in the background, and also enhanced the crowd to make it look as if there were more people there."

In fact, crowd enhancement comprised 75 percent of R/GA's 34 effects shots. To give scope and spectacle to the film's stunning battle scenes, groups of extras in period costume were moved from section to section in a given plate and shot with motion-control cameras; the individual crowd plates were then seamlessly blended into a single dramatic image. According to Ashford, it was dicey work: "When Mike and I sat through dailies, looking at all this beautiful film shot by John Toll, an Academy Award-winning cinematographer, we felt a tremendous amount of pressure. We knew that if you ever thought you were looking at an effect, it would take you right out of the film."

For the film's first full-scale battle sequence, Sterling Battle, director Gibson lined Wallace's ragtag Scottish horde on a hillside, facing the English Army. Hundreds of extras were made to look like thousands of Scotsmen by shooting them in different places along the hill, then blending those shots into one. Expanding the English Army was a tad trickier, especially since Gibson wanted the camera to pan with his character on horseback as he approached the English troops, who were moving their horses into position during the shot. "Although we had three locked-off cameras rolling simultaneously to capture other angles, our main camera that panned with Mel when he rode into the shot had to be motion-controlled," Ashford explains. "That sequence required a lot of coordination between visual effects supervisor Mike Fink, Mel Gibson and myself. I hired Peerless Camera to film the four different wedges of action Mike set up for the scene. For the first pass, we shot Mel riding in and all of the soldiers aligned on the right side of frame in the same plate. The center and left side of that plate were blank, except for the second-unit crew and their equipment, which we later had to remove. Then we moved all of our extras over to the middle of the frame and lined them up between markers so there would be no overlap between the wedges, nor so much of a gap that it looked like a split. It was complex to choreograph all the movement, but it was a lot easier to coordinate hundreds of people rather than thousands, so the cost-efficiency there came down to time. And that's the reason the shot works so well: the extras aren't static; the troops and horses are moving into position."

Unfortunately, the fickle Irish weather was constantly changing throughout the day, so each crowd plate had entirely different lighting. "No matter how quickly we shot, the sun would always dart behind the clouds," Ashford says. "With the help of CFC, we had to control all the light-

Before and after: Digital wizardry added twice as many British soldiers — as well as star Mel Gibson — to the right-hand part of the frame for a sweeping establishing shot just prior to the film's main battle sequence.

Photos courtesy of R/GA, Icon Productions and Paramount Pictures

ing and shadows, and even blend the grass so it matched across the plate. Then we extracted the sky from the plate where the camera pans as Mel enters frame, and put it behind the entire composited plate once we'd multiplied the crowds."

After R/GA had assembled a massive English Army in the computer, Gibson and his editors looked at the scene and decided that it would be much more dramatic if Gibson's entrance — and that of the Scottish and English lords meeting in the initial negotiation before the battle — was delayed! With today's digital technology, even that can be done. "We extracted Mel and the English soldiers out of the individual crowd wedges and delayed them by slipping the sync so that they arrived later in the plate," Ashford explains. "We had to slip the sync across the crowd-duplication wedges where the horses crossed the split lines, then redo all the crowd enhancement. That gave Mel and the editor the flexibility to change the action to increase the drama in the shot."

R/GA even digitally multiplied heaps of dead bodies to magnify the carnage in the aftermath of the Sterling Battle. "That was a fun shot we did with a very small group of people," Ashford says. "Mike Fink shot stills of fake horses and extras acting as if they were dead on location. Then he brought that material back here, blended it into a single plate and rotoscoped Mel into the frame in front of the carnage."

One of *Braveheart*'s most horrifying battles depicts the Scots raising up their chiltrons, or long spears, at the last second as the English horses charge at them. "Naturally, the animal rights people would've been upset if we'd really stabbed any of our horses," Ashford says, "so we created CG chiltrons that pierced the horses' bodies. The horses were supposed to charge toward camera and rear, but when Mel shot the horses, he couldn't get them to do that, so we had him film those actions separately. We then blended those plates to make it look like one continuous action. In the reverse angle, the spears piercing the horses were CG. We took photos of the actual prop chiltrons, texture-mapped them onto our CG chiltrons, and added blood. Blood is hard to do, but Mel was smart about the way he cut it, so it worked. We also had to break the spears when they pierced the horses. There was one shot where a trained horse rolled over, and Mel said, 'Wow, it would look great if it had a spear in it.' It wasn't a planned effect, but we tracked a chiltron onto its stomach, and made the spear roll with the horse through the whole shot."

As the finished film attests, visual effects supervisor Mike Fink, effects producer Tricia Ashford and the entire R/GA team did a superb job of using high-tech effects to create *Braveheart*'s period feel. "We needed to do an incredible job," Ashford insists, "or risk pulling audiences out of the film. We're very pleased with the work. They are invisible effects."

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High-Tech Railroading

Special effects supervisor Richard Yuricich, ASC details how this trainbound action-adventure was brought up to steam.

by Bob Fisher

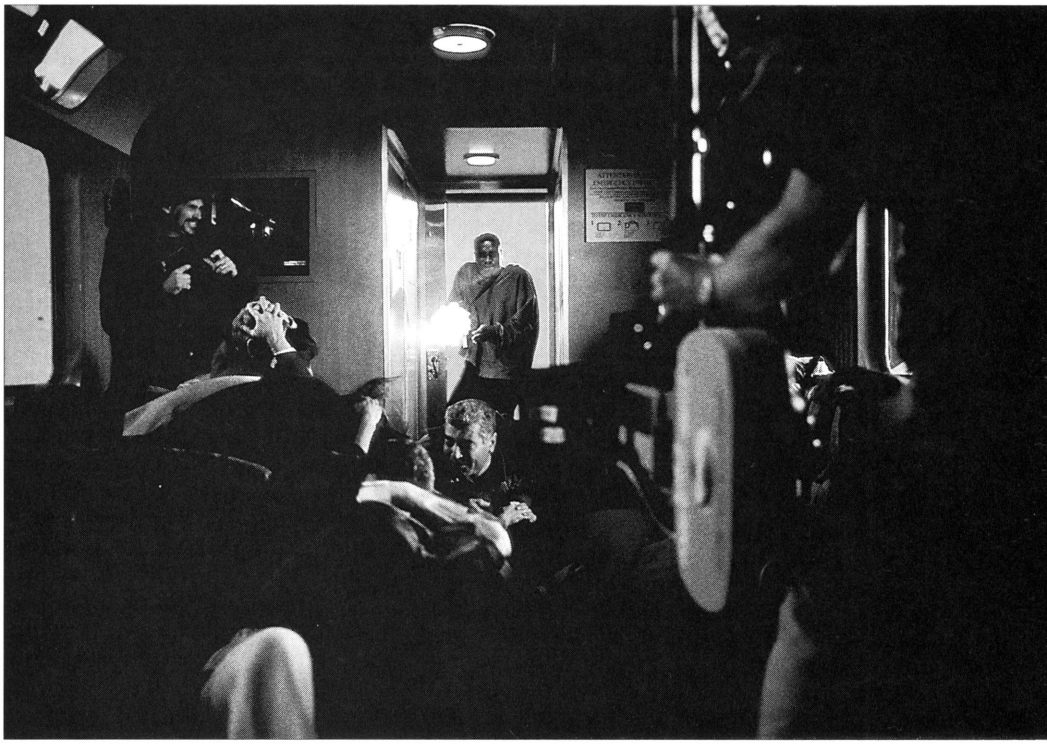

Photo by Joel David Warren, courtesy of Warner Bros.

An action scene is shot against greenscreen. Exteriors were digitally added later to provide the illusion of a moving train.

IN *UNDER SIEGE 2: DARK TERRITORY*, weapons designer-turned-extortionist Travis Dane (Eric Bogosian) and his gang of mercenaries hijack a top-secret military satellite capable of wreaking global devastation. Embittered by a thankless government, he wants a billion-dollar ransom and revenge, not necessarily in that order. Dane's first target is Washington, D.C., and he plans to use a commandeered luxury train as a mobile control center for operating the satellite. Unfortunately for Dane, one of the train's passengers is Casey Ryback (Steven Seagal), an ex-Navy Seal who, as fans of the first *Under Siege* film know, doesn't take kindly to being held captive.

Directed by Geoff Murphy, a veteran of such action-adventure films as *Never Say Die, Young Guns II* and *Freejack*, *Under Siege 2* was shot partly on location in Colorado in pristine wilderness settings aboard a real, 1,000-foot-long train specially built for this purpose. However, the film also boasts 650 effects shots that cumulatively create an array of spectacular scenes it would have been impossible or impractical to film in live-action.

Conjured up by visual effects supervisor Richard Yuricich, ASC, the effects include a number of startling images. Particularly impressive is a head-on train crash on a viaduct spanning a 240-foot-deep gorge. The models are exquisitely detailed; each frame is precisely choreographed, right down to the miniature suitcases which become part of the rubble.

Yuricich has spent much of his career working with Douglas Trumbull. They first teamed on *2001: A Space Odyssey*, when both men were in their early twenties. They also worked together on *Blade Runner, Star Trek — The Motion Picture, Close Encounters of the Third Kind* and *Brainstorm*. Yuricich also teamed with Trumbull at Future General, a research and development company founded by Paramount Studios for the purpose of inventing the next generation of cinema. That company is generally credited with inventing the ride film and the Showscan format, which played a big role in launching a new industry that we now call location-based entertainment. Yuricich and Trumbull were also co-founders of Entertainment Effects Group (EEG), the forerunner of Boss Film Studios.

During the past several years, Yuricich has mainly worked on large-format special-venue film projects, but *Under Siege 2* marks his return to feature work. He recently sat down to discuss his contributions to the project.

American Cinematographer: **How did you initially become involved with *Under Siege 2?***

Richard Yuricich: I was ready to get back to working on narrative films, and this was a good place to start. A few days after I was hired, I read the script very carefully, and realized that some 35 to 45 minutes of the movie — depending on how it was cut — takes place inside the train, which is supposed to be traveling from Colorado to Los Angeles. We were going to shoot almost all of these interior scenes on Stage 18 at Warner Bros., in Burbank, California. The plan before I came onto the scene was to use rear projection to establish the Colorado settings outside the train windows.

Why didn't you stick with that plan?

Rear projection is a great tool for establishing locations, but I was concerned because we would be using it in so many dramatic and action scenes. It takes time to set up the projectors and screens, and we had many different sets

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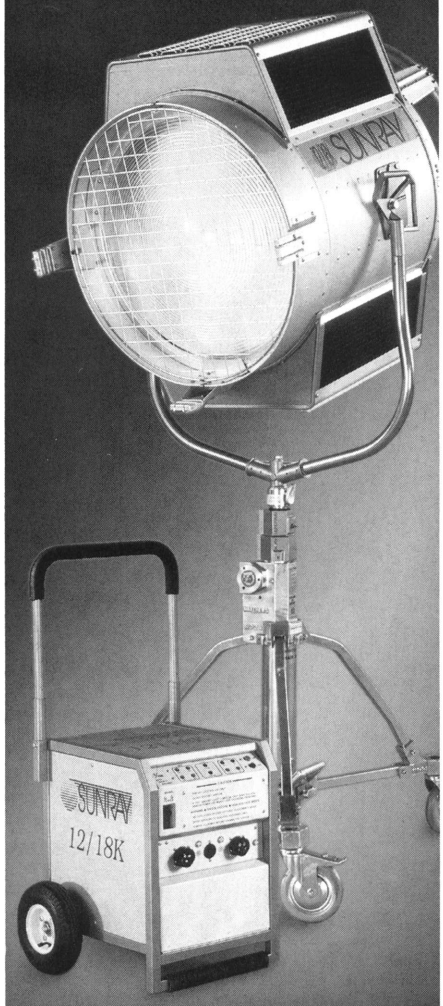

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requiring scenery outside the windows. I also knew it was going to require a lot of space, and I had concerns about whether it would look realistic enough to keep the audience fooled for that long. I thought that we could do it more efficiently and more realistically with digital compositing. One of the things I wanted to be able to do was to move the camera freely when we were shooting blue or greenscreen shots. I knew that some very good motion-tracking software had been developed by several digital facilities. I decided that if we could put greenscreens behind those windows and develop a motion-tracking program for the cameras, we could reduce the need for stage space, save time, and it would look more cinematic and realistic.

What was in the back of your mind at that point in the making of the film?

Many considerations came into play. If you are shooting rear projection, there are such considerations as the focal length of the camera lens and the distance the screen is from the foreground. Think about what that means on a moving train car, which is 80 feet long with anywhere from six to 10 windows depending on how it's configured. Think about the camera moves you would have to make based on the director's needs, and remember that there will be fight sequences and other action. I thought about using two or three rear-projection screens and blending them behind one or two bulkheads. Jim Cameron handles that technique very effectively. But there was so much action, so many actors involved, and so many scenes requiring background outside the windows, I decided it was worth investigating an alternative.

When you first came up with this idea, what did you have to do to convince the director and producers that it could work?

The point is that I didn't know it was going to work. I was just thinking out loud. I felt the possibilities for motion-tracking would give us more freedom to move the camera. One of the producers suggested that we try a test to see how it worked. So we brought in Ed Jones, president of Cinesite, because Cinesite had the necessary digital firepower and great tracking capability.

We rented the bus that was used in *Speed* for the test and shot the interiors scenes on a soundstage at Warner Bros. We did some handheld and some dolly shots with stand-ins for actors on the bus. I used a bluescreen background and HMI lights on the test, because it was the fastest way to get it done, though I wanted us to be as precise as possible with lighting. There is a lot of latitude at digital workstations for the technicians and artists to clean up blue spill light and uneven fields of view, but I wanted them to devote their time to working on the creative aspects of the shot, so we double-blued the HMIs and lit the background screen to make it evenly blue. Brad Kuehn, the Cinesite creative director, assigned Derek Spears and Rodney Iwashina to write code for motion-tracking. It only took them a couple of weeks, though it seemed like an eternity. On the handheld shots, we moved the camera from side to side, and from the back to the front of the bus. The bluescreen ran from the ceiling to the floor with an 18-foot radius around the sides of the bus. That determined where the camera could track. We tried everything, including a tilt shot over the driver's shoulder, and a tracking shot following a passenger walking down the aisle of the bus. That shot had a 130-degree pan and it ended with the camera tilting over the actor's shoulder as he sat down.

What film format did you use during the tests?

We shot the background plates with four overlapping VistaVision cameras using 35mm focal length lenses. That gave us almost 180 degrees of coverage, so if necessary, we could fill different windows. There was also less distortion on the edges of the frame with these focal lengths. We used a regular 35mm production camera for the bluescreen shots on the bus, composing for 1.85:1. We also found that we only needed to scan our background plates at 1K resolution. That was because of the application. Imagine yourself sitting on a fast-moving train, looking at the scenery through a window. It isn't crisp and sharp because the

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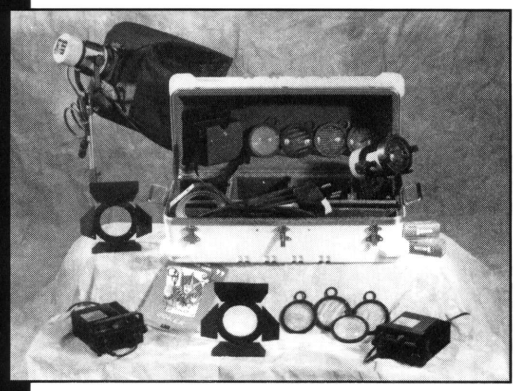

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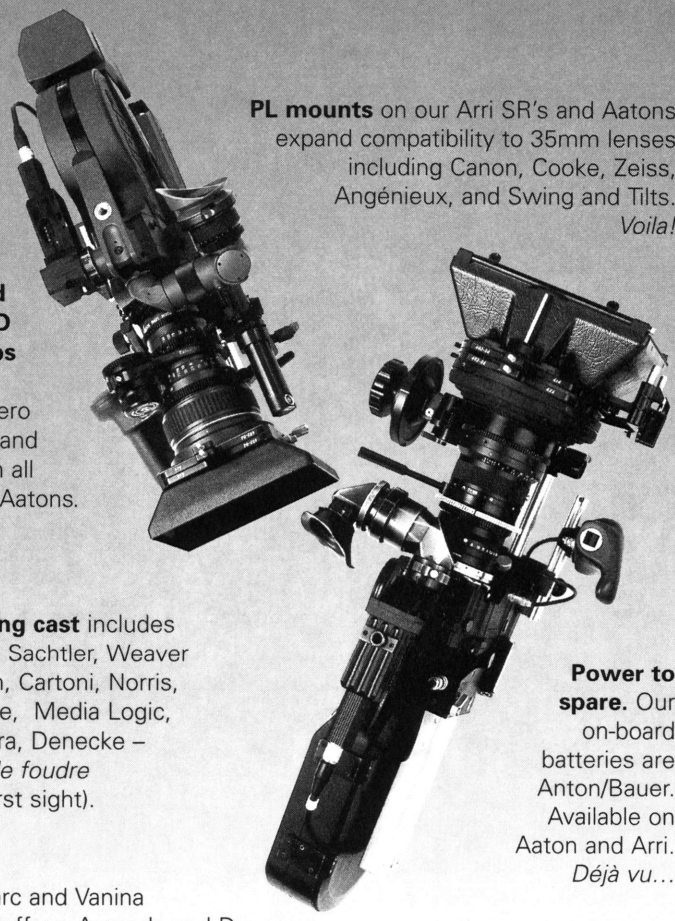

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train is moving and the images are strobing and blurring. The test worked so well that I decided we only needed three cameras, with 28mm lenses instead of 35mm. When we overlapped these cameras, we were covering about 165 degrees. We had a couple of problems on location with one of the VistaVision cameras, and no replacements were readily available, so we switched to two overlapping 65mm cameras with 24mm lenses. That gave us about a 160-degree field of view.

Were there any other useful discoveries made during the test?

Derek Spears and Rodney Iwashina came up with the idea of putting lines of red tennis balls on the background screen. That enabled the compositer to divide the plate into a grid, which was very useful for tracking the motion of the camera. That data was applied to the positioning of the background plates into the digital composites. The tests told us that it costs a little more than using rear projection, but the creative flexibility we gained, the time saved between setups, and the fact that we didn't need an extra space to accommodate rear projection more than made up for the [additional expense.] After we completed the test, the decision was obvious.

How does that jibe with your statement about deciding that 1K resolution for the backgrounds was sufficient for scanning the film into digital format?

Our goal was for the images outside the windows to be secondary to the main action. It was mainly foliage, rocks and trees, and we were traveling by it very quickly. If the background had included a lot of architecture, it would occasionally have been more difficult to get by with 1K resolution. If there was a master shot with a wide-angle 21mm lens, and the director cut into a tight shot, and the background behind the actor was important, we could extract it from the negative at a higher resolution. That's the digital film equivalent of making an optical blow-up.

How did you match the interior and exterior scenes? What if the plate was filmed in bright

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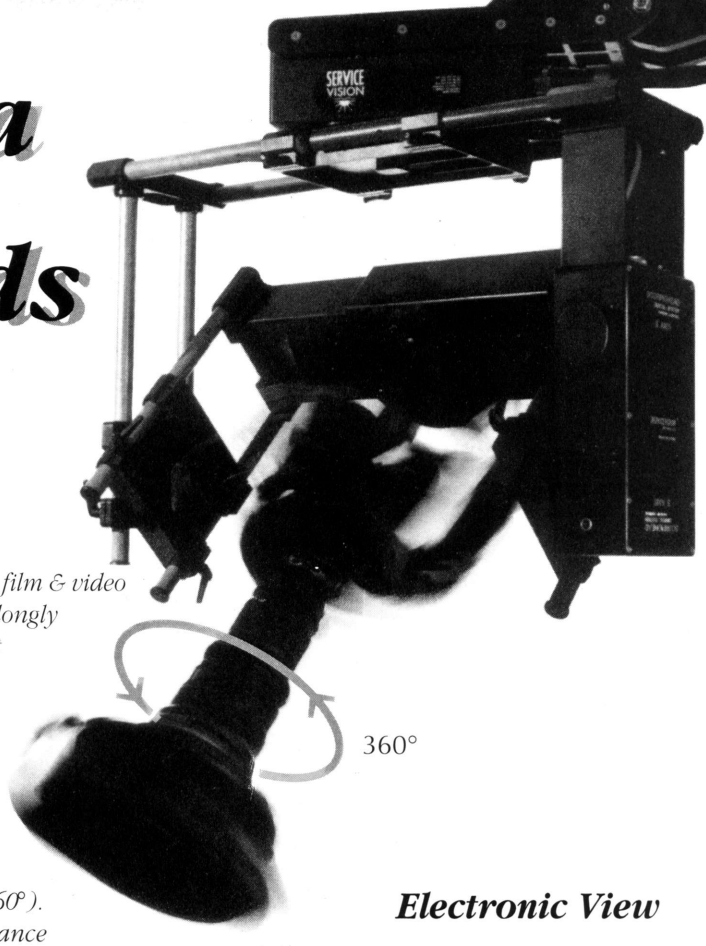

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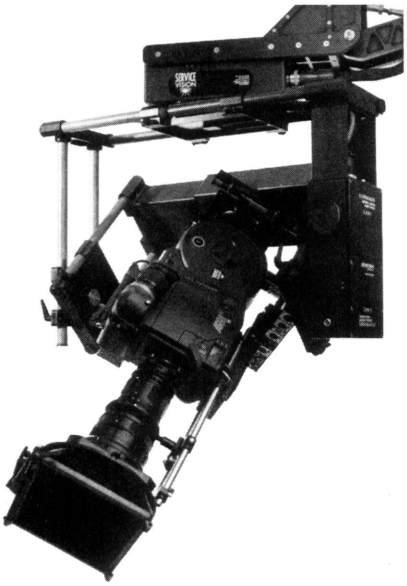

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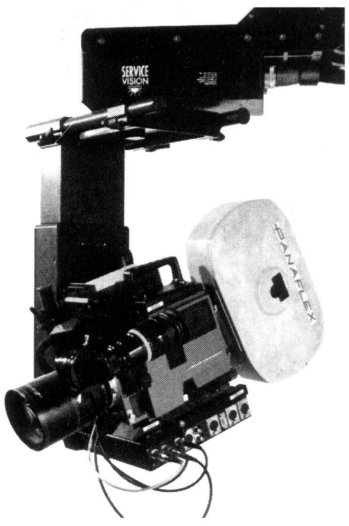

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sunlight, and Murphy wanted a dark scene filmed inside the car?

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Which film stocks did you use for plate and greenscreen shots?

We could have shot with any of the Eastman EXR films, but I chose the 5293 stock because it satisfied our needs for lighting the greenscreen stage. It's a 200-speed film with a tight grain structure.

Was all the digital work done at Cinesite?

They did the majority of the work, but there were different facilities involved. Four shots were completed in London at CFC. Metrolight created 23 shots including some very convincing CGI. Albert Brenner, the art director for the film, developed a design for the satellite. The miniatures and sets for the train crash were built by WKR Productions — Robert Wilcox and Tad Krzanowski. I've worked with both of them before. They're great artists, engineers and model-builders.

How did you decide what should be shot as models and what the scales should be?

The story and budget determine what you do. The best thing to do would be to crash a real

train into another real train. The next best thing is to build a miniature at the largest scale with the most parts and details. Most of the cut-aways to the train are shots of models, especially at night. There is an aesthetic for shooting miniatures. You have to understand what questions of physics come into play. We shot the models of the train on Stage 12 at Warner Bros. against a greenscreen background, and later composited it with location film that we shot in Colorado.

How about the big crash scene?

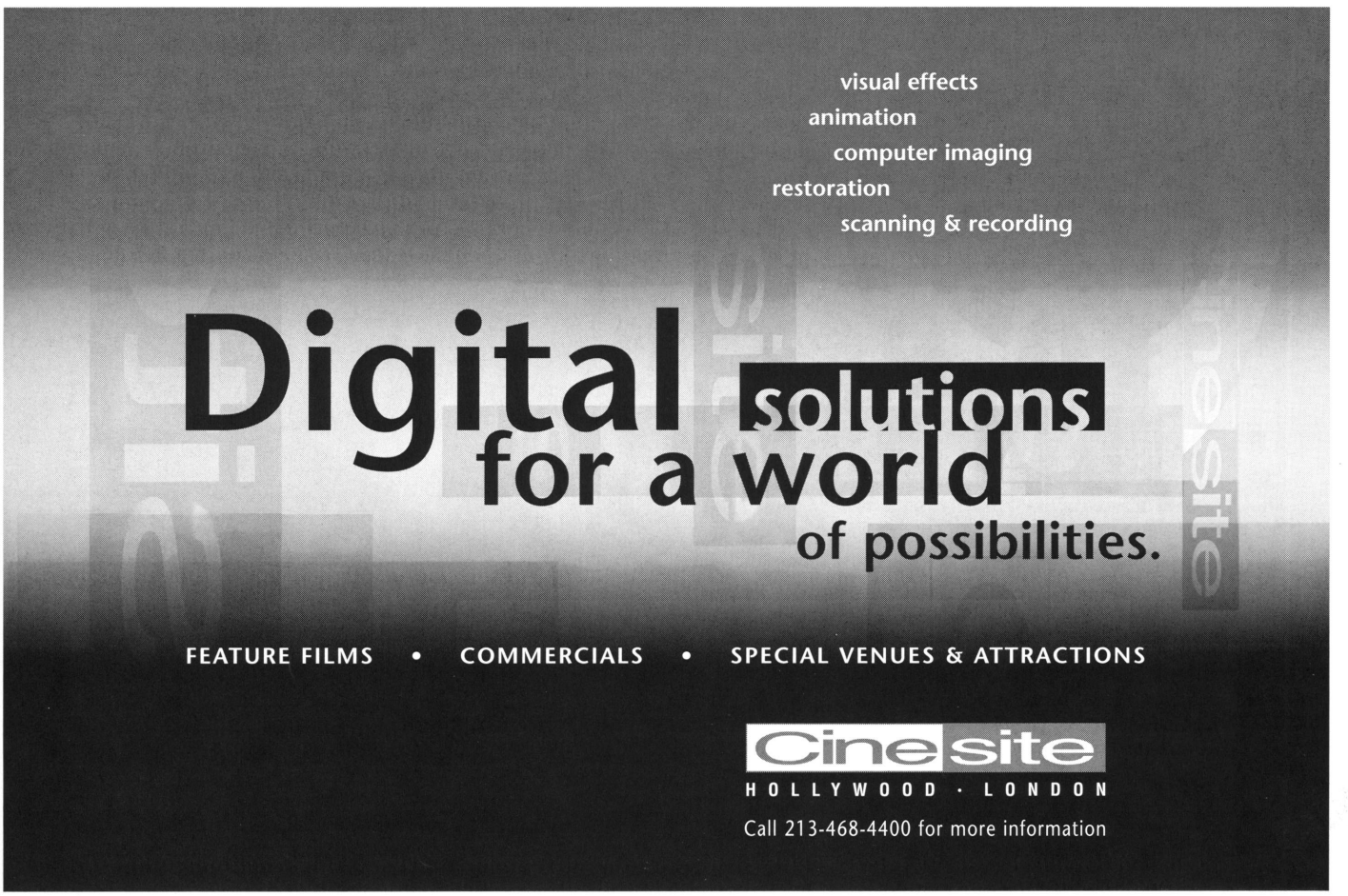
Our story calls for a train crash that occurs on a viaduct that's 240 feet high — we called it the 'grand slam.' First, we created computer models predicting what would happen in the crash, and also conducted physical tests with models to determine what would happen. Based on those tests, the modelmakers made some structural and design changes. For example, some of the passenger cars and oil tankers were made from aluminum, so they would crush on impact. The other models were made from a more sturdy fiberglass material. There were water bladders in the tankers, which created the illusion of fuel flying out after the crash. We built a 1/20-scale architectural model of the actual crash set, and we used that to previsualize the crash scene. For the actual shoot, we dug a gorge that was 30 feet deep. At a scale of eight to one, it would be 240 feet deep in real life. We moved 11,000 cubic yards of earth in Simi Valley and built regular cement foundations and pillars for the bridge. We poured nearly 100,000 pounds of concrete, and had 1,000 feet of track made to scale. That means the actual track would have been 8,000 feet, or about a mile and three-fifths long. The trestle, or bridge, over the gorge was 200 feet long. The real trestle would have been 1,600 feet long.

We used the architectural model to plan everything, including camera angles, and filmed the crash with 10 cameras, very carefully positioned. That included a couple of high-speed cameras. You need a sense of what the frame rate should be to simulate the effects of gravity on scale models of that size. We had one shooting 180 frames a second, and another at 120 frames per second. We also stretched time by duplicating some frames in some shots.

We could only shoot the scene once, because the models were destroyed in the process, so I wanted as many angles and as much coverage for the editor as possible. Footage from nine of the cameras was used. There were a lot of physical pyrotechnics rigged to go off during the crash and when the trains spilled into the gorge, and also a lot of Fuller's Earth on the trains to send up a cloud of dust after the crash. There were a million small details.

Do you have any concluding thoughts on the project?

We used a lot of high-tech effects, and had a lot of help from many wonderfully talented people. But my bottom line is that you always have to remember that you are there to help the director tell a story. That's the way it has been from the beginning of the industry. Visual effects is still basically a game of inches and seconds.



Gaslight Twice Told

Part 1 of 2

Wildly successful British parlor play is expanded for the big screen, first by the English and then by the Yanks.

by George Turner

"I have gone all out to write a horror play and make your flesh creep. And there is no reason to believe that this reaction is medically or chemically any worse for you than making you laugh or cry. If I have succeeded, you will leave the theatre braced and recreated, which is what you go to the theater for."

So wrote British playwright Patrick Hamilton in the introduction to his 1928 play, *Rope*. This healthy credo is also applicable to his novel, *Hangover Square*, and his 1938 play, *Gaslight*, a.k.a. *Angel Street*.

Set in London, 1880, the action of the play occurs entirely in an old, gloomy four-story house on Angel Street, located in the deteriorating Pimlico district and occupied by Jack and Bella Manningham. Bella fears she is losing her mind because of Jack's accusations that she unconsciously steals and hides things. The housekeeper, Elizabeth, is sympathetic, while Nancy, the sluttish maid, is openly contemptuous of Bella and encourages Jack's attentions. Jack goes out "to work" every night, but actually returns over the rooftops from a nearby vacant house to rummage in the boarded-up fourth-story room, where the previous owner's belongings are stored. In his absence Bella always hears noises above her bedroom, and her gaslight ebbs, as though a light is being turned on upstairs. Before Jack returns the light always flares up again.

One evening during Jack's absence she is visited by Sergeant Rough, a retired policeman, who insists that her husband is trying to drive her mad. The original owner of the house was Alice Barlow, whose throat was cut 15 years ago by someone trying to find her rubies. The deranged killer, Sydney Power, failed to find the jewels and has returned to search for them. He has a wife in Australia but assumed the identity of Jack Manningham and married Bella to get the money to buy the house. Now he wants to be rid of her. Breaking into Manningham's desk, Rough finds objects Bella supposedly had lost, including a brooch taken from Barlow's body. Hidden inside the bauble are the rubies. When Manningham returns he tells Bella that two doctors will certify her as insane the next day, but Rough comes out of hiding and arrests Manningham. Bella asks to speak privately to her trussed-up husband. When he asks her to free him she brandishes a razor and rages at him in homicidal fury. The police take Manningham away. Rough apologizes to Bella for giving her "the most horrible evening of anybody's life." "Oh, no, — the most wonderful," she replies. "Far and away the most wonderful."

The play had a one-week tryout at the Richmond Theatre, Richmond, England, on December 5, 1938, directed by Gardner Davies. It was not an expensive production because the entire play was staged on one set and there were only five cast members. Gwen Ffrangcon-Davies and Dennis Arundell played the Manninghams, Milton Rosmer essayed Rough, Elizabeth Eustis played Nancy and Florence Edney appeared as Elizabeth. Audience reaction was so enthusiastic that *Gaslight* was brought to London's Apollo Theatre, where it opened January 31. During the long London run, amateur rights were marketed in the United States and *Gaslight* quickly became popular with little theater and stock companies.

Late in 1939, John Corfield of British International Pictures Ltd. purchased the British motion picture rights and acquired Thorold Dickinson to direct. Dickinson, a former film editor and assistant director, had worked in pictures since 1923 and had a penchant for atmospheric decor, rich cinematography and de-

A newspaper ad for the re-titled 1953 U.S. release of the British version.

***The scheming Nancy (Cathleen Cordell) grudgingly helps Bella (Diana Wynyard) dress in the first screen version of* Gaslight.**

tailed acting. After directing only eight features, most of them front rank *(Men of Two Worlds, The Queen of Spades),* he retired to academia as a university dean.

Determined not to make merely a photographed play, Dickinson and screenwriters A.R. Rawlinson and Bridget Boland expanded the original story to include the murder, also adding sequences occurring in the square and streets, at a piano concert, at a livery stable, and in a crowded music hall. Because England was at war with Germany, a Teutonic villain was desirable; hence the play's scoundrel Manningham, was re-named Louis Bauer, alias Paul Mallen.

Principal photography commenced at Denham Studio in February, 1940 with the Austrian-born Anton Walbrook (Adolph Wohlbruck) and Britain's Diana Wynyard portraying Paul and Bella Mallen. Both had long experience in European, British and American plays and films. Wynyard, wife of director Carol Reed, is fondly remembered for leading roles in *Rasputin and the Empress, Cavalcade, One More River* and *Reunion in Vienna.* Walbrook's Viennese charm was shaded with a brooding intensity that made him ideal for sinister romantic characters; he is best remembered today as the demonic impresario of *The Red Shoes* and the obsessed gambler of *The Queen of Spades.* Hefty Frank Pettingill, a veteran actor and artist/writer from Liverpool, was cast as the enigmatic Rough. A blonde American stage actress, Cathleen Cordell, became the provocative but predatory Nancy, and Minnie Raynor — Mrs. Hudson of the Arthur Wontner/Sherlock Holmes series — portrayed Elizabeth. Roles not in the play are enacted by ex-child star Jimmy Hanley, Robert Newton (in a surprisingly small role), and Marie Wright (as the murder victim).

Duncan Sutherland, Scottish architect, screenwriter, film editor and actor, designed the sets, which are heavy with atmosphere (although somewhat upgraded). In his book "Art and Design in the British Film" (1948), designer Edward Carrick notes that Sutherland "established a reputation that brought him right to the forefront when he art-directed *Gaslight. . .* and through his decor and set dressing built up an authentic Victorian atmosphere that could not have been bettered."

The camera team was headed by lighting cameraman Bernard Knowles, later a noted director. His brother, Cyril, served as camera operator. Both were veterans of the silent era. In England the makeup of a camera crew differs from the American system;

Photos courtesy of Critt Davis

the first cameraman is in charge of lighting and the overall style of the film, while the operator works with the director in planning camera angles and moves.

There were difficulties, including war jitters: the Nazis might have attacked at any moment. Fortunately, the picture wrapped before the bombing of London began. However, an influenza epidemic caused several delays. On February 19 Jimmy Hanley repeatedly fumbled his lines, finally admitting that he was too ill to continue, and the studio doctor sent him to bed. He was back the next day, shaky but able to do retakes. Wynyard's voice began recording badly and it soon became evident that she was ill. Joss Ambler, another flu victim, dropped out and had to be replaced by Aubrey Dexter.

The Knowles brothers used two cameras outfitted with 25mm, 35mm, 40mm and 50mm lenses. One camera proved to be afflicted with focus drift. A negative scratched at the lab caused further retakes; Bernard Knowles complained until the studio changed labs. And then there was the creaking floor of Stage 3, where most of the action was filmed. Supposedly, this was remedied, but the mikes continued to pick up squeaks not heard by the ear. Wild tracks and looping became necessary for many scenes.

Bella Mallen begins to question her sanity after a round of strange events.

The film's main title appears, distorted and wobbly, within a closeup of a gaslight flame. The opening scene is an impressive crane shot moving through the park to the house. Expanding the production necessitated interrupting the action of the play, diluting the unrelieved claustrophobic terror playgoers felt for a woman trapped among suffocating Victorian draperies and bric-a-brac. However, the film's new prologue, depicting the murder of Alice Barlow, is stunning. Filmed on March 27-28, it is surprisingly brutal considering that scenes far more innocuous were regularly being chopped ruthlessly out of imported American films by the British censors. A petite elderly lady is shown in the drawing room with her needlework as a dark figure looms up behind her. A hand reaches stealthily around to pick up the coil of yarn at her side; the hands then whip the yarn around her neck and strangle her — the actual death is shown in close-up. A drunken toff passing outside, hearing what he mistakes for the thrashings and moans of ecstasy, laughs and totters on. In a series of angular shots joined by fast wipes, the hands of the killer rip into the furniture, empty a jewel case, grope through a trunk. Intercut are views of his flickering shadow on the walls. At one point he callously hurls the victim out of her chair, which he tears apart. The camera then captures a close shot of the victim on the floor with eyes staring up through glasses, as the killer's hand reaches to snatch a brooch. Following a montage of newspaper headlines, the house is shown with a "to let" sign out front; in the foreground, workers plant a small tree in the square. The scene then dissolves to the same tree 15 years later; in the background, workmen take down the weathered sign and begin putting the house in order. Ex-CID Sergeant Rough, now a stable keeper, sees the Mallens and their servants arrive. Recognizing Mallen as Bauer, nephew of Alice Barlow, he encourages his all-too-willing assistant, Tom, to play up to Nancy.

Another added sequence of a piano recital is the essence of sadism. Having stolen a brooch he had given Bella — the one taken from Barlow's corpse — Paul offers to take Bella to a piano recital at Lady Winterbourne's home. He requests that she wear the brooch. Deliriously happy to be going out for the first time in months, Bella pretends that the brooch is unsuited to her gown. Paul secrets his watch in her purse. During the recital he "discovers" that the watch is missing, then digs it out of Bella's purse. She becomes hysterical, creating such a scene that the recital is halted while Paul gently removes her. He further accuses her of hiding the brooch.

Scenes in which Paul takes Nancy to a music hall are intercut with Rough's revelations to Bella about Paul's duplicity. Again, this somewhat cools the suspense of the situation, but watching Paul enjoy an evening out with a trollop while his wife totters on the brink of the madness he has induced makes him seem all the more despicable. The music hall scenes are quite good, with Jack Barty as a beefy chairman and the Darmora Ballet troupe performing spectacularly athletic Offenbach can-cans. A total of 81 extras appear in the audience.

Musical director Muir Mathieson, whose work in Alexander Korda's London Films productions had placed him at the top of his profession, and composer Richard Addinsell, who would soon gain renown for his "Warsaw Concerto," added to the picture's effectiveness with a fine dramatic score. The music, part of which is built upon a petite waltz theme, is sinister but subdued, becoming intensely dramatic during the murder scene and again in Bella's scenes with the trussed-up Paul.

Bella and her husband (Anton Walbrook) return from their disastrous night at a concert.

The picture is enormously satisfying and the ending is the best in any version. Wynyard is terrifying in her insane harangue against Walbrook, actually driving her former tormenter into mental collapse. He is obviously helpless when he is allowed to fondle the rubies before being taken away. Then Wynyard parts the drapes, opens the windows and goes onto the balcony; outside, the camera, in a long crane shot, pulls back far into the square, through the trees, until a flickering gaslight looms in the foreground.

Broadway producer-director Shepard Traube acquired American dramatic rights to *Gaslight* and changed the title to *Angel Street*. A West Coast tryout at the Pasadena Playhouse with Judith Evelyn and Tom Stevenson attracted little attention. (Ironically, Stevenson eventually appeared in the 1944 film version in a supporting role). It opened at the John Golden Theatre in New York on December 5, 1941, with Judith Evelyn and Vincent Price as the Manninghams, Elizabeth Eustis as Nancy, Florence Edney as Elizabeth and Leo G. Carroll as Rough. Its chances appeared so slim that tickets were printed only for opening night and the following Saturday shows.

Amazingly, it was an instant hit, surviving even the attack on Pearl Harbor, which occurred two days after the opening and killed a couple of other Broadway shows. It was destined to run for over three years — 1,295 performances. Audiences were enchanted by the rising and falling of the gaslight, but the most magical moment was a bit of business improvised by Traube: Rough leaves his hat in the room after his talk with Bella. According to David O. Selznick, an enthusiastic patron at one of the early performances, fully one-third of the viewers were leaping up and screaming "The hat!" before the detective returned for it.

Meanwhile, Columbia Pictures Corporation bought American rights to British National's production. The negative was at the New York office for several months before it was sent to Hollywood, edited and retitled *A Strange Case of Murder*. Granted Production Code Seal 03294 on February 16, 1942, it was advertised but never released.

Louis B. Mayer, meanwhile, was eying *Angel Street* as a starring vehicle for his Austrian beauty, Hedy Lamarr.

(To be concluded in the next issue)

Gaslight (1940)

(A Strange Case of Murder; Angel Street)

A British National *picture; distributed in UK by* Anglo-American Film Corp.*; directed by* Thorold Dickenson; *produced by* John Corfield; *from the stage play by* Patrick Hamilton; *screen play by* A. R. Rawlinson & Bridget Boland; *associate producer,* Richard Vernon; *photographed by* Bernard Knowles; *camera operated by* Cyril Knowles; *settings by* Duncan Sutherland; *assistant director,* George Pollock; *edited by* Sidney Cole; *musical score by* Richard Addinsell; *musical direction by* Muir Mathieson; *recordist,* A. J. Brunker; *recorded on* Western Electric Mirrorphonic System; *made at* D & P, Denham. *Running time, 89 minutes. Tradeshown in London, June 1940. Columbia Pictures US version, retitled* A Strange Case of Murder, *re-edited and issued PCA seal #03294, February 19, 1940, but not released. Commercial Pictures, Inc. US version, re-titled* Angel Street *and re-edited to 80 minutes, released November 1952.*

Paul Mallen, Anton Walbrook; *Bella Mallen,* Diana Wynyard; *Rough,* Frank Pettingill; *Nancy,* Cathleen Cordell; *Ullswater,* Robert Newton; *Cobb,* Jimmy Hanley; *Elizabeth,* Minnie Rayner; *Alice Barlow,* Marie Wright; *House Agent,* Aubrey Dexter; *Lady Winterbourne,* Mary Hinton; *Pianist,* Angus Morrison; *Chairman of Music Hall,* Jack Barty; *and* The Darmora Ballet; *Bits,* Allan Lewis, Edwin Ellis, Mollie Rayner, Miss Pat Ronald, Alfred Atkins, Johnny Schofield, Joe Arthur, Frank Marsh.

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Setting the Camera Free

After 25 years, the Louma demountable camera crane continues to amaze with its versatility.

by David Samuelson

IT SEEMS DIFFICULT TO BELIEVE, BUT IT has now been 25 years since the first shot was taken using a lightweight demountable camera crane and a remote pan-and-tilt head. Today, demountable camera cranes are used on virtually every film, in television studios, on television remotes and on pop concerts that are broadcast or recorded live. They are one of the very few items of equipment that straddle these disciplines.

It all started in 1970 when two young French cameramen, Jean-Marie Lavalou and Alain Masseron, had a problem filming inside an operational submarine. They needed to track their camera above and below and between the tightly-packed instruments, along the narrow walkways, through bulkheads and up and into the conning tower. Their solution was to attach a wooden scaffold pole to a heavy-duty pan-and-tilt head mounted on a narrow Elemack "Corridor" dolly. At the end of the pole they secured, upside-down, a gyro pan-and-tilt head, and onto this they attached a 35mm Cameflex camera. With this crude device they managed to fly the camera around the submarine, past the periscope, over the plotting table, between instruments and even into the crew mess room. As the camera passed through a bulkhead on its way to the dining area, one of the pair started the gyro head, gently tilting the camera downward; as it emerged on the far side, the other operator put out his hand to keep the tilt going until the camera was looking directly down onto the sailors' dinner plates. With an 18mm lens and lots of depth of field, it's amazing what you can get away with!

No one who first saw that shot could guess how it was done.

Dubbing their invention the Louma Crane, a name derived from the last and first syllables of their names, Lavalou and Masseron (now known as "Loumaciens" in honor of their skill with the equipment) took the device to Albert Viguier at Samuelson Alga Cinema in Paris and then, after a couple of years of development work, to Samuelson Film Service Ltd. in London. There, proper drawings were made and two additional features were added: an electronic remote-control head, which emulated the handles of a normal geared head, and a lightweight video assist.

During the development period they devised, and in 1970 patented, the unique system of maintaining the camera platform level at the front end of the arm. Instead of the usual system of parallel linkage, they devised a system using a rotating rod within the boom arm which was attached by a gearing at either end, to the center column to detect the amount of boom arm tilt, and at the front end to keep the entire platform level.

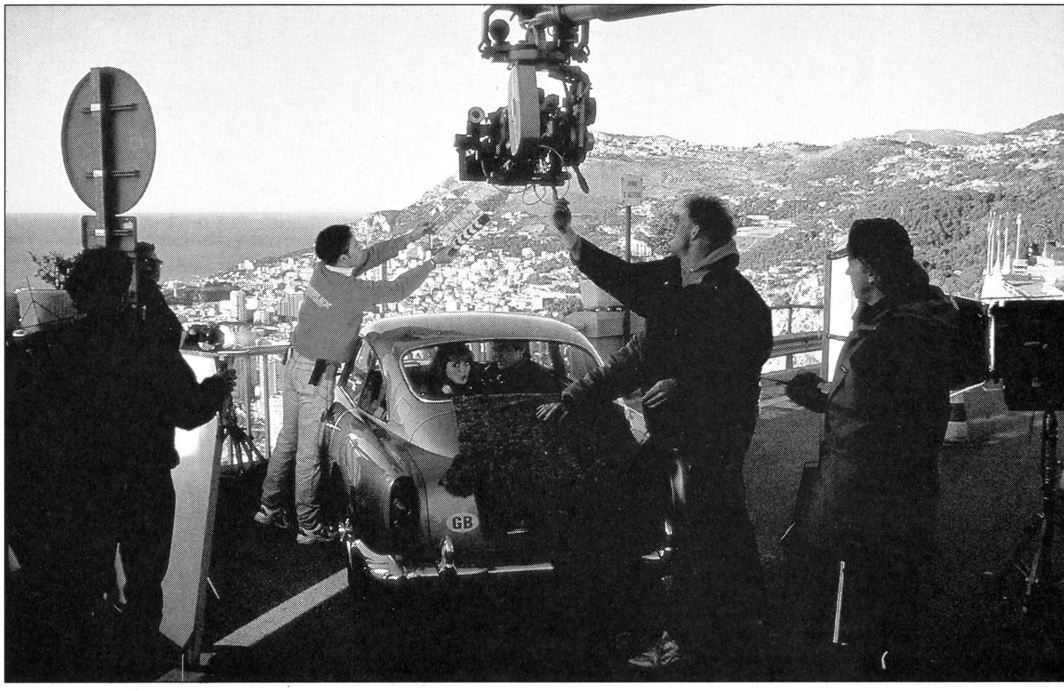
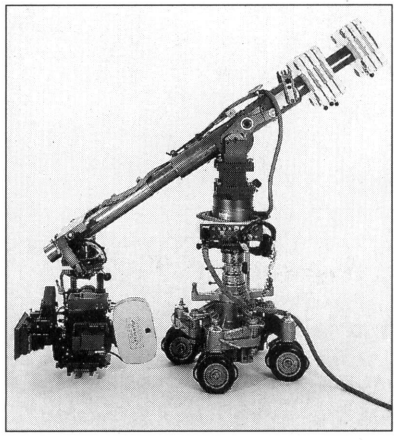
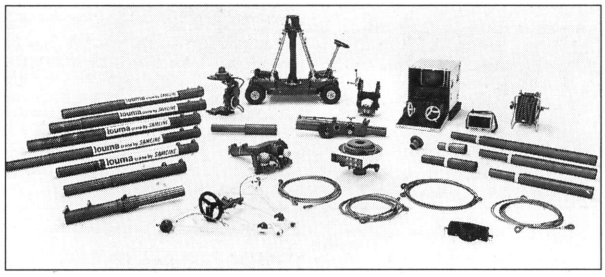


Photo by Keith Hamshere





Above: ***A Louma camera crane was used to film the last scene of the new James Bond film,*** **GoldenEye,** ***in the hills above Monte Carlo.*** **Far left:** ***A Louma crane in short mode. Near left: A Louma crane in demounted mode.***

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The 65-degree downward tilt of the Louma camera crane enables it to dip deep into a set.

This system gives the Louma crane the ability to tilt much more steeply up and down (120 degrees overall) than is otherwise possible; enables the boom arm to pass through a smaller opening; gives it a slimmer profile (much appreciated on a live pop show); creates a smaller, less obtrusive shadow; makes creating the boom arm from the modular elements a quick and simple operation; and makes it possible to vary the arm length without having to mix and match link rods (stabilizing wires are used only when the boom arm is more than 15 feet long).

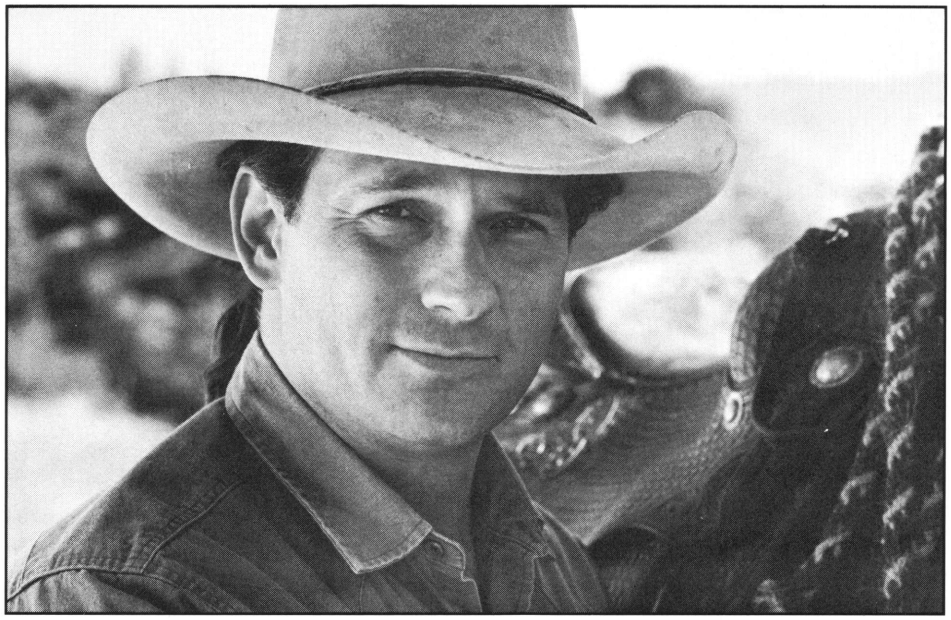
No matter how large or sophisticated the entire ensemble became over the years, every element has can still be carried up a narrow flight of stairs by a single person, or by two at most. The only item that cannot easily be lifted by two people is the dolly, and that is fitted with four steerable and crabbable wheels that will run on track or on a flat surface. One of the early prototypes even had an extending boom arm, while another had a 360-degree third axis "roll-over" camera mounting.

Other features that have been a standard part of the Louma camera crane kit since early days — long before any of the camera manufacturers got around to providing them — are frame-line generators and powerful yet sensitive focus and zoom controls.

The collaboration with Lavalou and Masseron was fortuitous for Samuelson Film Service, which had already made a prototype remote head for use on *Ryan's Daughter* (1969) and had been using lightweight video assists since 1960 (the first major application being on *Oliver* in 1967).

The manufacturing was done jointly in Britain and France. Hervé Theys led the electronic development of the remote control pan-and-tilt head in Paris, and he and Guy Tournerie, chief engineer of Samuelson Alga Cinema, designed the multi-channel, multi-contact slip rings on both the pan and tilt axes.

The first production versions were ready for use in the late 1970s, and one of the first directors to use it was Roman Polanski on *The Tenant*, photographed by Sven Nykvist, ASC. These accomplished filmmakers, along with Jean-Marie and Alain, truly showed what the equipment was capable of. Most notable was the film's opening title background scene, where the camera threaded itself in and out of a tenement building in one long take. Also memorable was the scene in which they used the detached remote control head on its own, low-



Randall Gregg is entitled to wear the hat: he used to be a professional rodeo cowboy. Since 1974, he has worked on features and videos; and on commercials with such film makers as Leslie Dektor, Amir Hamed, Jim Manera and Fred Petermann.

"We weren't even using Clairmont's cameras on that shoot. But when we had a mystery problem, I sent them footage and Clairmont solved it," says Director of Photography Randall Gregg.

It turned out to be some latent edge numbers fogging part of the image area. The rawstock manufacturer later withdrew the whole batch.

"The film fogging episode happened years ago," says Randall Gregg, "But it shows how *accessible* everybody is at Clairmont."

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"I was new to L.A. I was new at being a First Assistant. We were on location out of town. When we got a phone call from our editor telling us we had light-struck dailies, I knew I needed help."

Blame the crew

"We were renting from another rental house—not Clairmont—because the producer had a deal of some sort. And now he was blaming the crew and the camera, naturally enough."

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"I called Denny Clairmont at his home. He said: "If you'll send me a piece of the footage, I'll solve your mystery." Which he did. It wasn't his camera, it wasn't his job, it wasn't his problem. But he took care of it."

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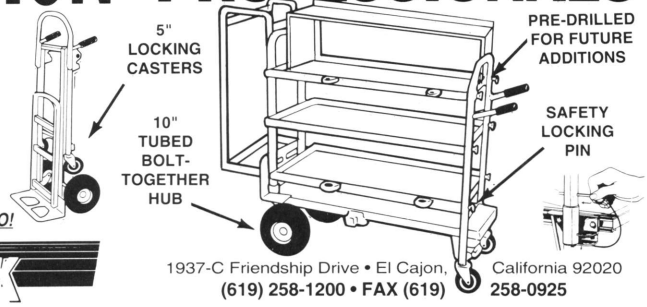

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There are both 1000 ft. and 400 ft. displacement type magazines. A new feature is the light valve which allows the operator to direct all the light to the viewing system, or to the video assist, or combo which splits the light between both viewing and video assist.

35 mm, Reflex Camera

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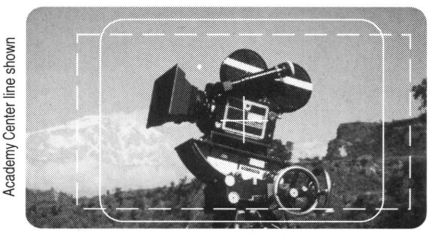
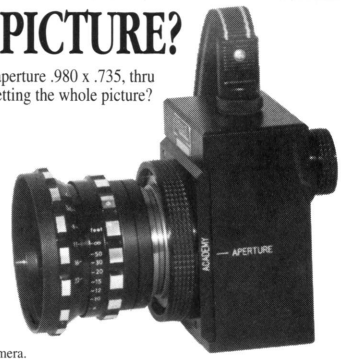
Ground Glass 1.85 & T.V. on Academy Center line shown





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ering it on a wire rig down the center well of a long winding spiral staircase to film a conversation between two actors as they walked all the way down the stairs.

It was at about this time that two other important people in the Louma story first saw the crane in action. One was a young American film cameraman who was backpacking through Europe in 1976. While attending a concert one evening, he couldn't believe his eyes when he saw an unmanned camera mounted on the end of a long boom arm emerge from the side of the stage, glide around the lead guitarist and move behind the drummer's left elbow. The open-mouthed cameraman was Andy Romanoff, who became the first American Loumacien and is now CEO of Louma L.A. in Los Angeles.

In the late 1970s, a young American filmmaker attending the Deauville Film Festival emerged from his hotel room one morning to find a Louma camera crane set up on the hotel terrace. After taking one look at the device, Steven Spielberg knew he had to have one in Hollywood for his forthcoming production, *1941*, which would be photographed by William Fraker, ASC (who went on to win an Academy Award nomination for his efforts).

The Louma camera crane has always been considered by its originators, who still work the cranes "hands-on," to be a complete system. When it became obvious that a new aid for the focus operator was required, they were the first to develop a second video camera to look at the lens scalings. They were also the first to develop an integral communication system so that crew members could plug in (and nowadays, use radio headphones if need be) to talk to each another during a shot. When Spielberg asked for a small loudspeaker just above the camera so he could talk to an actor from afar, the feature was installed and has been on every Louma camera crane setup ever since.

The latest enhancement is "automatic back-pan compensation," or, as it has been officially named, Smart Pan. One problem common to all camera cranes, but

more acute with remote-control cranes, is keeping the camera oriented in a set direction as the boom arm is swung quickly from one side to another. If the boom arm is swung, from, say, left to right, the operator must pan from right to left to compensate. Keeping a moving actor framed correctly in the center of the picture becomes very difficult and takes a great deal of skill. Smart Pan, a retro mod which is currently being incorporated into all Louma camera cranes, automatically compensates for the boom movement so that the operator can concentrate fully on the frame composition.

Yet another advantage of the demountable camera crane concept is the ease with which it can be helicoptered into an otherwise inaccessible location. The device can be pitched on mountainsides to catch rock climbers, or set down in deep gorges to film on the edges of swirling rapids.

A recent Australian automobile commercial shows off the Louma crane's strengths to great advantage. In the spot, a wide-angle lens follows a car driving across an arid desert. As it approaches the camera, which is mounted on a Louma camera crane itself mounted on a camera car, the car is revealed to be have no driver or passengers. As the auto moves alongside the camera car, which is now traveling at the same speed, the camera tracks around the traveling car to show it to advantage from all angles. The camera then rises above the car and dives in through the open roof, performing a nearly 360-degree pan around the interior of the car to show the plush seats and sophisticated instrument panel, "sits down" on the rear seat to show the passenger's view through the windscreen, moves over to the driver's seat to get the driver's point of view, and then goes back up through the sun roof, rising high above the desert to see the driverless car vanishing far into the distance — all in one shot, with no cuts and no help from computers.

The Loumacien responsible for that shot was Geoff Brown, an Australian now residing in Paris, and the director of photography was none other than Dean

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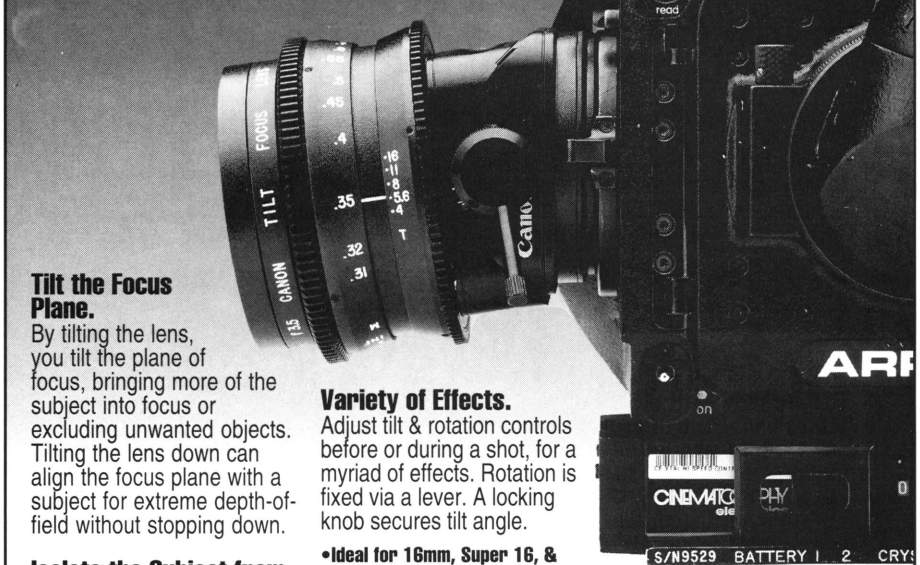

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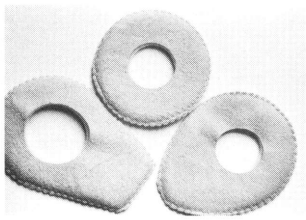

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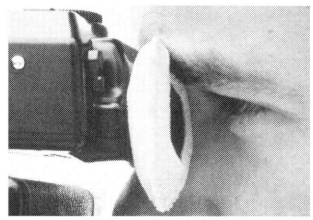

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Semler, ACS, a past Oscar winner for his work on *Dances With Wolves*.

The Loumaciens are crucial to the Louma concept; from Jean-Marie and Alain onwards they are a group of dedicated technicians, most of whom have now been with the project for more than 15 years, and who spend their lives doing the impossible. U.K. Loumacien Adam Samuelson, for example, whose most recent credit is the new Bond film *GoldenEye*, recalls starting off one particular year at -45° Celsius in the north of Sweden and filming two months later in Cessaria in Israel, where the temperature was +50° C. Among his most vivid memories is shooting the boat sequence with Barbra Streisand on *Yentl* in a Force 10 howling gale. On that occasion the Louma camera crane was mounted on a scaffolding platform rigged onto the stern of the boat. As the boat pitched and heaved and rolled and dipped, so too did Adam and the crane.

In 1980 the crane received a Scientific and Engineering Award from the Academy of Motion Picture Arts and Sciences. Academy President Fay Kanin said at the time, "I was intrigued by the possibilities of the handheld camera — and that certainly has made its impact. But then along came something altogether new — and the results are nothing short of extraordinary. Our industry is constantly changing, and the Louma camera crane is is going to change the way pictures are made. It is an incredible device that makes impossible photography reasonably simple."

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A Frigid Piece of Real Estate

by Mary Hardesty

Just like author Tom Clancy's character Jack Ryan, cinematographer Jim Weisiger hates to fly, yet sometimes that's the only way to get to a location. Weisiger, who has shot spots for Sony TV, Dole Fruit Juice and Chuck Wagon Dog Food, has spent the last few years flying all over the world to shoot the Re/Max Realty campaigns. For the 1995 campaign he found himself in his least favorite mode of transportation — a helicopter.

"I was in a helicopter accident a few years ago and I really hate to fly, but that was the only way in to our remote glacier position in Alaska," explains the intrepid cinematographer.

"In Alaska, people are very casual about helicopters. They use them like mopeds to get around. It was amazing. We'd be standing in a remote spot and here would come all these helicopters carrying our equipment in cargo nets," recalls Weisiger about the 30-second "New World" spot, which depicts early man in search of a "dwelling by the water," trekking across the glacial bridge that connected North America with the Asian continent.

Because the commercial was shot on Matanuska Glacier just outside Palmer, Alaska, everything had to be helicoptered in, including the local Native American actors.

"This meant we had to pick every crew person and every piece of equipment very carefully," says Weisiger. "We used a base camp for things we brought, and we never lacked for anything due to the Alaskan helicopter crew's extreme efficiency. They could get us from one location to another in short order, so the camera assistants had to be able to very quickly put the equipment into the waiting helicopter slings. Someone would yell "incoming" and everyone would snow-jump onto the helicopters. The assistants had to be on their toes to keep all the equipment buttoned up and protected from helicopter blasts."

The shoot also required a very experienced guide, because the location literally was moving under the crew's feet. "The interesting thing about glaciers is that while some areas may look like stone, underneath it's all ancient ice, and the ancient fissures are often covered by recent snow," explains Weisiger. "The trick is to never step on any snow. We had a safety officer with us at all times and his philosophy was that he would rescue people, but not equipment. Even if the surface we put the equipment on wasn't moving when you stepped on it, it might move in ten minutes." Because of these warnings, the crew managed not to lose any equipment or team members, but even with a guide, the crew remained a bit anxious.

"When you're eight miles into a 27-by-four-mile-wide glacier, it' s a bit disconcerting," points out Weisiger. "It's not an area you can really walk out of if there's trouble, so it takes a certain amount of confidence in the weather forecasters and helicopter pilots to go there in the first place."

An Arri III package was used for ground filming, and Tyler mounts were used on the helicopters. "We did long shots from the chopper of the Inuit family walking through a treacherous ice environment, and then we moved in for detailed close-up work," explains Weisiger, who was happy with the skill level of the local camera assistants he hired. "When we did the long shots, we would throw white tarps over our equipment so it couldn't be seen from the helicopter's camera."

For this glacier shoot, Weisiger encountered a situation similar to his Caribbean island shoot (covered in *AC's* November '95 issue). "Since water and ice both are reflective, we also used a polarizer to good effect on the glacier. It

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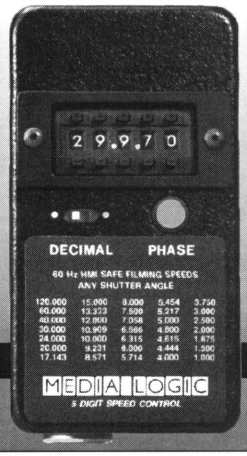

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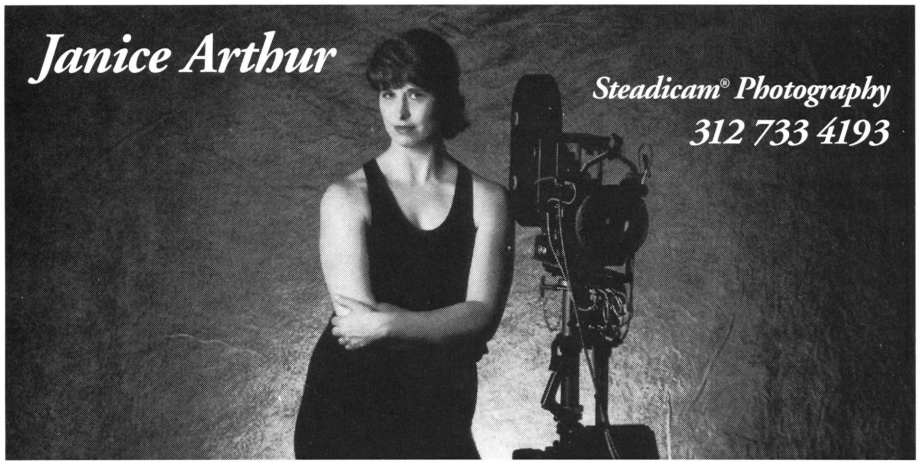

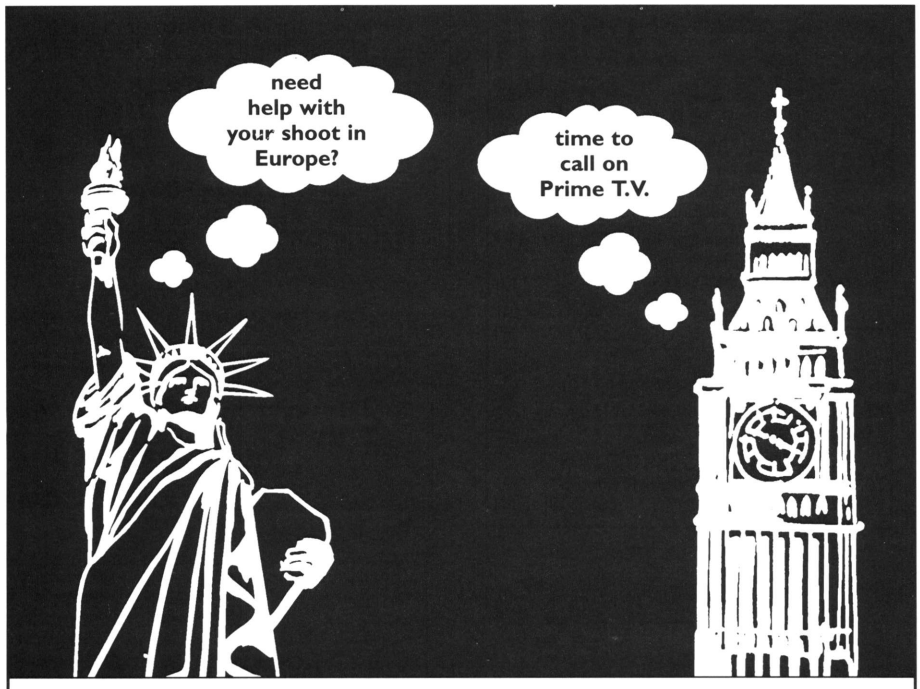

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helps lift clouds and kill ice glare."

Weisiger took the same three lenses on both shoots. "We took a 150-600mm Otto Nemenz zoom, a 25-250mm Cooke, and a 12-120mm Angenieux, which is a very sharp lens," says Weisiger, who shot mostly with Kodak 5245. "It's gotten so much easier to shoot using a zoom. When we first started out, we had the manual Canon zoom where you slide the focus knob up and down, but each position on the zoom lens had a different focus, which made it difficult at best," recalls Weisiger. "What Otto Nemenz has done is make it so you can zoom with a motor and be able to have the same focus criteria for each millimeter. Before, you could never zoom on a camera with that lens, and now it's easy. I've used it for the past 15 years and I love it."

Shooting in Alaska may require careful equipment and crew selection, along with a bit of the "roughing it" attitude, but the cinematic payoff can be large. For instance, golden hour is three hours long during some parts of the year.

"In the spring and summer the sun goes down at around 11 at night and comes up at five in the morning," says Weisiger. "This is particularly great for car shoots, but you have to be very careful what time of the year you pick to shoot there," he warns. "In winter it's the reverse and night is 24 hours long."

Credits:
Spot Name: "New World"
Client: Re/Max
Cinematographer: Jim Weisiger
Director: Bruce Dorn
Production company: Bruce Dorn Films

If you have an interesting or unusual shooting experience you would like to share, please contact Mary Hardesty, Contributing Editor-Commercials, at (310) 455-3160.

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TurboCube ships with all the needed computer hardware, software, hard-disk storage, video and Macintosh monitors, control panel, audio speakers and interconnect cables. Full-screen video is displayed on a 20-inch component video monitor, while 20-inch and 14-inch Macintosh monitors provide ample room to display multiple TrackSheets, ClipSheets and controls for effects.

To facilitate graphics-intensive projects, the TurboCube's Power Macintosh 7100 front-end is equipped with 32 MB of RAM. The standard TurboCube system includes storage for one hour of online-quality video and two hours of CD-quality audio. Through the addition of ImMix or third-party storage modules, total system storage can be expanded to six hours of online-quality video and 12 hours of CD-quality audio.

ImMix' VideoCube Lite nonlinear online system, designed for a broader range of video professionals, is a preconfigured, full real-time finishing system. Like all ImMix workstations, the VideoCube Lite has the power to create and combine all of its effects in real time, without any rendering. The system shares the TurboCube's capabiliites: disk-based nonlinear online editing, real-time effects creation for video and audio, real-time mixing of four channels of CD-quality stereo audio, and real-time character generation of high-resolution, anti-aliased titles.

The VideoCube Lite system ships with all the needed computer hardware, software, hard-disk storage, editing control panel, computer cables and terminators; customers configure the system with the monitors and speakers of their choice. The standard VideoCube Lite system includes storage for one hour of online quality video and two hours of CD-quality audio. Through the addition of ImMix or third-party storage modules, total system storage can be expanded to six hours of online-quality video and 12 hours of CD-quality audio.

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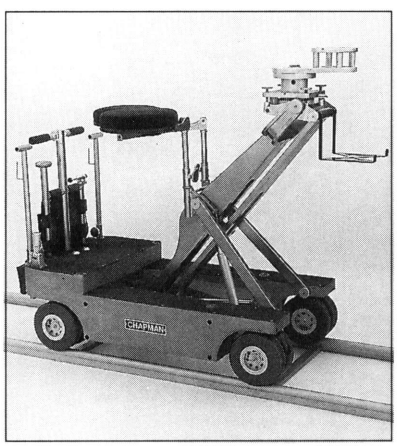


Dollies

Chapman's Hustler II Dollies can now come equipped with built-in track wheels. The new wheels are grooved, allowing the Hustler to be used both on or off track, without a tire change. The Hustler II dolly comes standard equipped with a set of pneumatic wheels, which enables the dolly to have easy movement on both rough surfaces and stage flooring. The Hustler track wheels work on all tubular and I Beam straight tracks to save production time. The Hustler II is nickel-plated for easier maintenance and features the new open Mitchell mount and battery tray. The tray was designed to place the camera battery in a more efficient spot, closer to the camera. The open Mitchell mount system enables easy accessibility and allows lower camera positioning.

The Hustler II dollies are equipped with an improved valve which increases the speed of up and down movement to 2 seconds. All Hustler II dollies also come equipped with a universal stop valve, which allows precise feathered stops at any chosen up or down position of the arm.

Chapman/Leonard Studio Equipment, 12950 Raymer St., North Hollywood, CA 91605, (818) 764-6726, FAX (818) 764-2728.

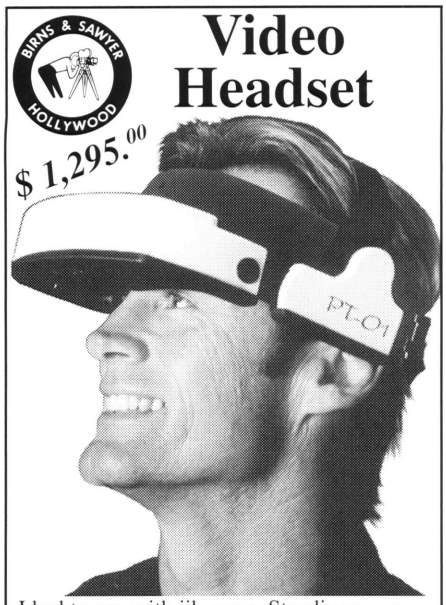
Automated Luminaire

High End Systems' Cyberlight SV automated luminaire achieves a 10 dB or 69% SPL reduction in overall noise level when compared with a standard Cyberlight. The unit features a homogenizing filter located in the green slot on the color wheel and a full 3200-degree Kelvin color corrector. Gobos in the Cyberlight SV will be identical to those in Cyberlight and Cyberlight CX, and will also sport all LithoPatterns high-resolution glass gobos when the company begins producing the LT versions of these products.

High End Systems, (512) 836-2242, FAX (512) 837-5290.

Portable/Location SRGB Lighting Fixture

Videssence, Inc. has redesigned its Vid-Lite line of studio and location lighting fixtures. Vid-Lites are now available in individual fixtures, in two- or three-light kits, or in a complete new turnkey system called the Operation. The Operation is a complete studio/location lighting system for small studios, news bureaus or production companies. The package includes a complete accessory set for each fixture, hanging/mounting



Ideal to use with jib-arms, Steadicam, or handheld cameras, the PT01 Headset displays your NTSC video-assist image (color and black & white) in front of your eyes. With a weight of only 14oz, and many adjustments to fit your head, it is comfortable to wear. The display slides close to the eyes to optimize the image, slides out and tilts up allowing you to see the surroundings. The image appears as if displayed on a 3" monitor. Power input is from 6 to 16v DC.

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hardware, power distribution and dimming controls, and lamp sets. Also included are two Vid-Lite portable 192-2K portable lighting kits.

The company's Studio 2000 Modular Lighting consists of a family of SRGB fixtures that are extremely energy-efficient. The modular fixtures contain electronics with a reflector and lens shade of composite extrusion with dovetail tracks on the top, back and bottom surfaces. This feature allows fixtures to be ganged together to form a larger, multiple-source array of light where needed.

Modular lighting works as a medium zone lighting system in most studio or production environments. More importantly, it is being used to light facilities where low ceilings or other limitations preclude the use of traditional incandescent lighting fixtures. Videssence Modular SRGB lighting generates virtually no heat and requires only a fraction of the power required by incandescents.

The line's Hex-Star is a turnkey, multi-purpose studio lighting system made of 12 individually dimmable, 117-watt fixtures, with each fixture forming a spoke or rim light of a six-sided star array. The Hex-Star forms a canopy over the talent area, allowing a variety of effects determined by the balance between front (key), side/top and back lighting. The system provides dramatic medium-zone lighting to any production area for one to six people. With all 12 elements "on full" the system draws less than 1400 watts of power.

Videssence, Inc., 189 Airport Blvd., Burlingame, CA 94010, (415) 579-7577, FAX (415) 579-7579, videssence@aol.com.

Time Code Analyzer and Repair Kit

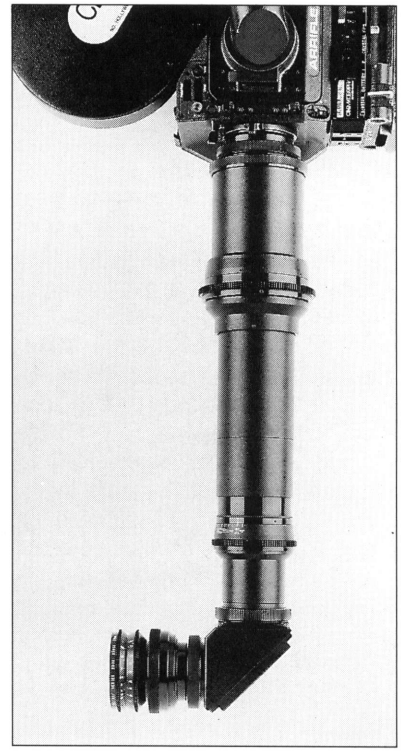
Brainstorm Electronics' SA-1 Time Code Analyzer incorporates the analyzer functions of the SR-15+ Distripalyzer in a small portable unit for studio or location operations. The SA-1 identifies time code format, monitors its phase with video and reports any errors.

The SA-1 identifies time code errors, along with faulty address; video phase; format (24, 25, 30, 30DF); and frame rate. A beeper sounds when errors are detected, and a push-button switch resets analyzer displays.

In addition, a comprehensive report that includes format, video phase and time code errors can be sent to an external computer or printer through the rear panel serial port. For location work, the SA-1 operates with a 6VDC battery pack.

The company's SR-3 Time Code Repair Kit is a time code regenerator which identifies and repairs faulty time code. Features include drop-out repairs, jitter reduction, auto video phase correction, auto drop flag correction, time code reader, video phase analyzer, and time code generator.

Brainstorm, 1155 N. La Brea Ave., West Hollywood, CA 90038, (213) 845-1155, FAX (213) 845-1170.



Periscope for 35mm

Century Precision Optics Series 2000 T3.3 Periscope is an optically advanced version of their popular periscopic relay system. Ideal for shooting miniatures, tabletop setups, and unusual points of view, the periscope incorporates ultra-low dispersion Fluoro-Phosphate glass. Field curvature and chromatic aberration have been dramatically reduced, and off-axis resolution is radically improved. The unit displays superior optical performance even at the widest aperture and is ideal for shooting in low light situations.

Compatible with a wide range of lenses, the Series 2000 contains its own iris, which reads directly in T-stops. The camera operator need only set the lens aperture to T2.8 and the Periscope's iris to the T-stop the exposure calls for. The iris provides the control necessary to eliminate vignetting. The new internal focusing system built into the Periscope makes it easy to utilize a standard follow-focus unit.

The Series 2000's 90-degree prism can be replaced with an optional direct-view section, extending the lens for impossible-looking shots.

Century Precision Optics, 10713 Burbank Blvd., North Hollywood, CA 91601, (818) 766-3715, FAX (818) 505-9865.

Blacklights

Altman Stage Lighting's UV-703 fresnel blacklight systems are heavy-duty fixtures that deliver a high-intensity illumination of fluorescent materials at a distance of up to 150 feet (50 meters). These fixtures do not require any fans for cooling purposes, and so create no audible noise interference. The 250mm borosilicate UV-A filter fresnel lens provides an even field of light from spot through flood.

Also new is the UV-704 outdoor blacklight system that features an integrated, internal ballast that allows the system to be operated in all weather conditions. An additional supplemental lens can also be added for even wider washes.

Altman Stage Lighting Company, 419 N. Larchmont, #31, Los Angeles, CA 90004, Phone/FAX (213) 962-8321.

Film Scanners

Imagica's Imager3000 film scanner is designed to transfer 35mm motion picture film into resolutions as high as 4K x 3K pixels (4K x 6K for VistaVision on the Imager3000V model) at 12 bit, 10 bit or 8 bit per color. It employs a tri-color linear CCD for pickup and a proprietary movement capable of fast film shuttling with the most precise film registration. Magnification and scanning position are optically variable to extract the maximum resolution out of the various 35mm film formats.

The Imager3000V is designed to handle both 35mm 4-perf and 35mm 8-

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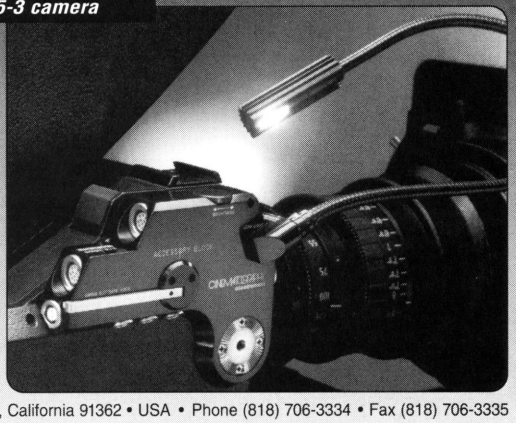

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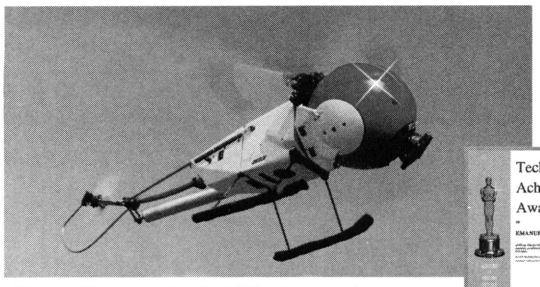

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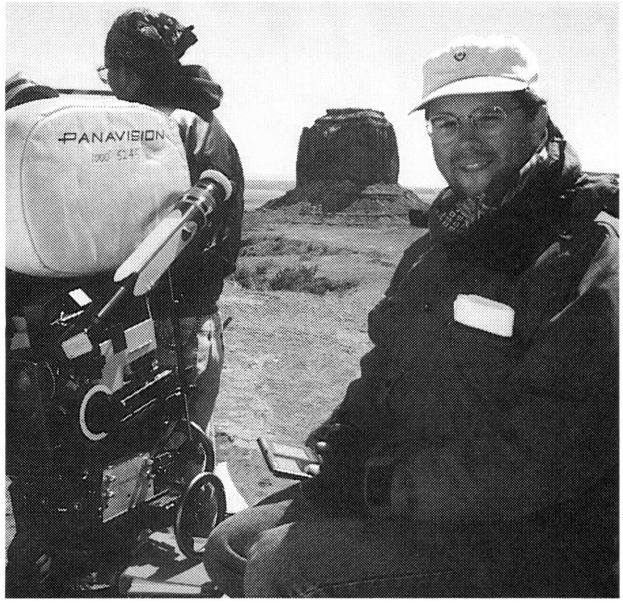

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perf (VistaVision) images. VistaVision scans can be done at resolutions as high as 4K x 6K (4096 x 6144 pixels).

Each scanner now uses a hardware-based color matrix to adjust colorimetry and color reproduction to match sample colorimetry. This provides compatibility with alternative scanning services, if needed.

The Imager3000 and 3000V are able to scan Cinemascope as squeezed or unsqueezed directly, so that each square pixel contains a desqueezed image, making it appear undistorted on the monitor without using CPU processing time after the scan has been completed.

The scanning resolutions are switch-selectable between 1K, 2K 3K and 4K. Adjusting the resolution to fit the project will result in improved efficiency and productivity gains.

The proprietary film movement with fast shuttle capability and the variable optical magnification have been retained from the earlier models. These features provide efficient scanning for the end user. The Imager3000 can read a full 4096 pixels for the width of 35mm Academy, which is 10% more resolution than other scanners, and it transfers full-resolution Academy images.

Imagica Corporation, 5301 Beethoven St., Suite 199, Los Angeles, CA 90066, (310) 306-4180, FAX (310) 306-2334.

Fluorescent Dimming Tube, Matting Technology

The Fluorescent Company's Directional Dimming Tube is a single lamp, two- or four-foot, flicker-free, high-output fluorescent fixture that allows you to control the amount of light output as well as the direction through a unique system of rotating shutters. It is low profile, lightweight and rugged so it can be mounted or built into any set.

The fixture can be screwed to any surface or can be mounted on a removable baby pin. It also features a high-frequency ballast which is externally housed to allow for more versatility. The fixture is constructed of aluminum and stainless steel and comes with a safety cable, mounting pin, and ballast with a locking XLR extension cable.

Also from the Fluorescent Company is the 2-Lamp and 4-Lamp fixture, a flicker-free high-output fluores-

cent panel with built-in ballast and a wireless remote control system. This allows you to turn individual lamps per fixture on or off via a hand-held controller, resulting in complete control when balancing a blue or green screen.

The company is collaborating with Composite Components Company, founded by Jonathan Erland, to provide a variety of products used in traveling matte cinematography, as well as consulting services. Notable among the materials produced is a new line of backings, specifically designed for digital electronic matting, known as Digital Green, Digital Blue, Digital Red, and Digital Yellow. The backings, offered as either paintable coatings or stretchable fabric screens, combine with the complementary fluorescent tubes to assist in refining the purity of the backing field. The Fluorescent Company also provides visible and invisible red, blue and green phosphors for use with Erland's Academy Award-winning reverse blue-screen process.

The Fluorescent Company, 19425-B Soledad Canyon Rd., #349, Canyon Country, CA 91351, (805) 251-4356, FAX (805) 251-7175.

Videographer Gear

Band Pro Film/Video's Kataband Vestique videographer's vest zips up the front and sports numerous solid and mesh pockets of various sizes for keeping tools and accessories handy or organized. When the wearer wishes to remove the vest, Vestique transforms quickly into a compact bag with zipper closure, outside mesh pocket and padded handle and shoulder strap.

Designed for use on location, Vestique is made of cotton and Cambrelle and features heavy-duty nylon zippers and anodized snaps. In addition to a pouch for a videocassette and two D-rings for cables, Vestique includes (in the extra pockets version) more than ten other pouches.

Band Pro Film/Video, 3403 West Pacific Ave., Burbank, CA 91505, (818) 841-9655, FAX (818) 841-7649.

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Sanken's 11 3/4-inch, five-capsule CSS-5 shotgun microphone offers precision directionality and accurate frequency response even below 2kHz. 19mm in diameter, it accepts all standard

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microphone accessories. The CSS-5 is especially effective in the 400Hz to 3kHz range, which largely contributes to stereophonic perception. The unit offers three switchable modes of operation: mono for sharp shotgun directivity and excellent low frequency definition, normal for precise directional hypercardoid focus with accurate stereo localization, and wide, for expanded 140-degree stereo image for cinematic ambience and SFX.

Sanken's COS-11 lavalier microphone is an ultra-miniature microphone ideal for voice or instruments in live broadcasting, location recording and studio applications. The microphone offers new levels of transient response, extended frequency range, and extremely low sensitivity to mechanical noise. Featuring a newly developed vertical placement of the diaphragm for a greater effective area within a much smaller casing, the COS-11 measures only 4mm x 16.1mm, providing a frequency of response of 40-12,000 Hz and dynamic range of 94dB.

Audio Intervisual Design, (213) 845-1155.

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Operational controls include brightness and color saturation dials and an on/off rocker switch.

Powered by 12V dc, the monitor weighs 14.5 oz., can withstand high vibrations, and can be used in areas of strong magnetic influence and at high altitudes. The monitor housing measures 5" x 4.7" x 1.6" and is fitted with two 1/4" mounting points located top and bottom.

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REBO Entertainment Examines Manhattan's Many Facets in Hi-Def

by Brooke Comer

High-definition video has become synonymous with pretty pictures, as technology companies use pastoral images to impress viewers with the medium's extraordinary resolution. But Steven Dupler, vice president of REBO Entertainment (which is part of the REBO Group), wanted to take HD to a new level. "Television is a content-driven medium," says Dupler. "In order for HD to advance, it had to find a more commercial venue." Hence *New York: Life on the Edge* was born. The series of 15-minute, cinema verité-style segments probes the city's numerous subcultures, including the rave scene, body piercing, transsexuals, black-market gun sellers, and outlaw bikers in the South Bronx.

Life on the Edge, which Dupler created and directs, is aired on Japan's 12-hour-per-day HD satellite broadcast channel, and can be viewed in America on the film festival circuit. The series earned the REBO Group accolades at the International Electronic Cinema Festival in Montreux, Switzerland this year, where the "Gender Outlaws" and "Outside Society" segments respectively won an Astrolabium Award for Best Documentary, and a UNESCO Citation for Outstanding Direction. "Outside Society," a piece about the homeless living beneath Manhattan, also received Le Nombre D'Or for Best Documentary at this year's IBC Festival in Amsterdam, and the series took two top prizes at the 1994 Multimedia Grand Prix in Tokyo.

REBO Entertainment partnered with Japan's Tokyo Broadcasting System (a TBS not to be confused with the Turner empire in America) to bring *Life on the Edge* to fruition. REBO was responsible for the creative content, and an Avid off-line in their New York facility. Then TBS's Noriko Mukai supervised the online at PCL, an independent Tokyo-based edit facility run by Sony.

"I initially envisioned the series as a reality-based television show with a cinematic approach," says Dupler, a former print journalist. "I wanted each series to tell a story. Each piece had to be driven by compelling characters." At first, he thought the 15-minute time slot, the only space TBS had available for the series, was too short. "But it turned out to be perfect," he admits. Dupler recognized the correlation between the time frame and the attention span of current audiences, but also found himself enjoying the challenge of directing 15-minute stories. "It forces you to pare down your vision to something clear and concise. If it works well, it's like you've cut a little jewel."

Life on the Edge couldn't have been made in HD six years ago, when the format had virtually no portable gear. In '92, REBO HD engineers Barry Minnerly and Abby Levine helped Beta-test the first portable HD camera system, manufactured by Panasonic. "The camera head was quite small and light, but the recording deck weighed 45 pounds, so it wasn't that portable. But for us, it was a big improvement," says Dupler, who took the Panasonic along in a canoe, a helicopter and on a sailing sloop to shoot a documentary.

Dupler currently shoots *Life on the Edge* with the Panasonic HD portable camera and a battery-operated HDTV deck, along with a crew of about eight to ten, including a line producer, video engineer, cameraperson, sound technician, gaffer grip and several PA's. He tends to use different camerapersons drawn from all facets of the industry, including James O'Donnell, an HD specialist; Winik, a director of photography with an extensive background in sports; and Maryse Alberti, whose resumé includes feature documentaries such as *Crumb* (see article in July '95 issue of *AC*). "Film camerapeople tend to have an advantage

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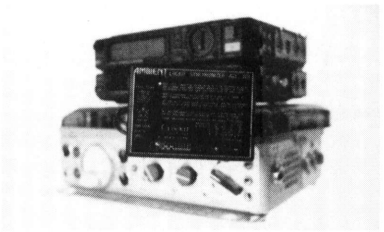

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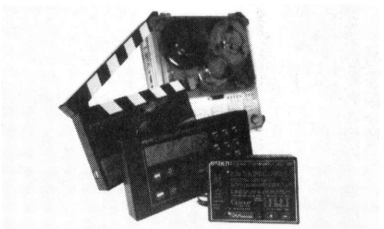

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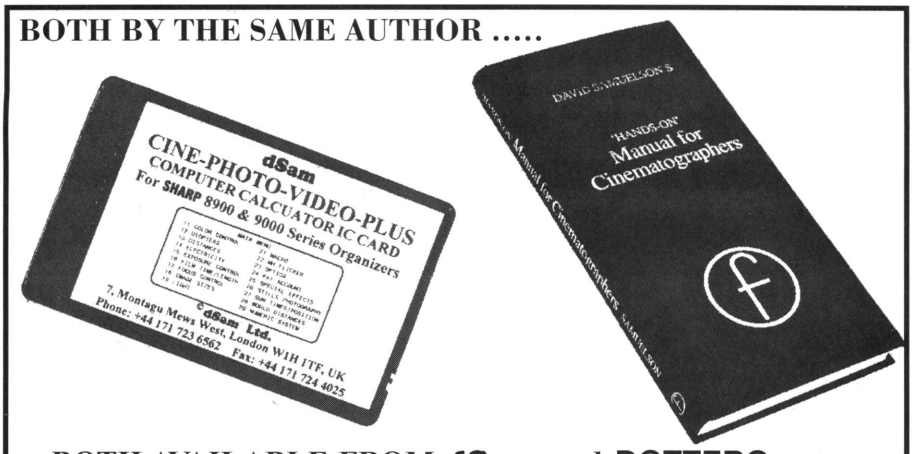

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over traditional Betacam shooters, because they're more used to working in a widescreen aspect ratio," Dupler explains.

Sony's HDC-500 camera has greater resolution, with two million pixels to the Panasonic HD camera's 1.5 million, but the Sony's size makes it more difficult to use on location shoots, so *Life on the Edge* tends to be shot with the Panasonic. "Besides," Dupler adds, "unlike the Sony, the Panasonic is able to take any standard NTSC lens, which makes it far more flexible. Plus, we own a Panasonic; we don't own a Sony." However, segments filmed in low light levels — such as the one that dealt with homeless people who live underground in the subway tunnels, or the peek inside the "rave" culture, which was shot in abandoned warehouses and dark dance clubs — were easier to shoot with the more light-sensitive Sony, so REBO rented one.

Dupler appreciates the creative input that camerapersons from other areas of the media bring to HD. "We've broken new ground by integrating other types of media into these shows," he explains. When a POV shot was required in a taxi scene, Dupler shot on Beta and used a tiny lipstick camera, which allowed more maneuverability in the small space. Then he ran the footage through the upconverter, which doubles the 525 lines of NTSC video to 1,050 to make the image compatible with HD. "It doesn't look like HD. It doesn't have that sharp resolution," Dupler observes. "It just takes regular NTSC and lets you work with it in a hi-def online suite."

Dupler credits TBS for giving him the flexibility to experiment. "A lot of networks would want an HD series to shoot everything in HD," he points out. "But TBS has been very cool about this. We've shot in Super 8, projected onto a white wall, and then shot that on a hi-def camera. Mixing media lets you come up with a composite image that takes advantage of the funkiness of low-res media and the intensity of HD. The juxtaposition is interesting, and sometimes it can be necessary to get the story across. People think HD has to be pure HD. It doesn't. If you need to blow up an image, or bring in another tool to help tell a story, what's wrong with that?"

Books in Review

by George Turner

Are They Really So Awful?

by Christopher Challis
Paul & Company, 289 pps., cloth, $16.95

It's not often that a leading cinematographer gets around to writing an autobiography. This one, by one of England's finest practitioners of the art, makes for good reading. The title, incidentally, comes from a question asked of him in 1926 by "a large, somewhat formidable lady" in the drawing room of the governor's residence in Malta: "Now, young man, you must be one of these film people. Come and sit next to me, and tell me, are they really so awful?"

The subtitle is *A Cameraman's Chronicle,* and there are memorable anecdotes throughout. The foreword is by Stanley Donen, for whom Challis photographed several pictures, including *Arabesque* and *Two for the Road.* Challis comes over as tough but gentle, artistic but down to earth, a shrewd judge of character possessed of a fine sense of humor and a remarkable memory. He turns a phrase well, as in his description of filming *Saadia* in Morocco with the most meticulous nit-picker in the business, Albert Lewin, as "seven months of a kind of hilarious hell."

Challis entered the film industry in 1935 (he was 18) as a newsreel company gofer. Two years later Technicolor camera department head George Cave put him to work at Technicolor's new English plant. He worked in the lab and as a trainee camera technician on the first two British Technicolor pictures, *The Coronation of King George VI* and *Wings of the Morning,* then went to India with the second unit of *The Drum,* Alexander Korda's great adventure film. After assisting such great cinematographers as Jack Cardiff and Osmond Borradaile, he was soon on his own as a lighting cameraman (director of photography). Some of his finest work was done between 1946 and 1957 for Michael Powell and Emeric Pressburger: *A Matter of Life and Death (Stairway to Heaven* in the U.S.), *Black Narcissus, The Red Shoes, The Elusive Pimpernel, Tales of Hoffman, die Fliedermaus, and others.*

This is anything but a technically oriented work, but it contains a lot of incidental information about cinematography, studios and filmmaking in general. There are revealing close-ups of many of the people behind the scenes. Here's Natalie Kalmus: "A lady of advanced years, which she attempted to disguise by the injudicious use of makeup, and with a bizarre taste in clothes more or less matched by her artistic ability to stand in judgment over protesting art directors, she succeeded in engendering massive ill-will during her reign, and her passing was marked with relief and discreet rejoicing."

Most of his memories are kinder, however, such as his summing up of a profane, hard-drinking gaffer, Harry Black. "I will never forget the debt I owe him for all the help and advice so generously given to me on my first picture as lighting cameraman. A character among characters, with which the industry abounded, their contribution so large and their rewards so small compared to so many others."

Horror in Silent Films

by Roy Kinnard
McFarland, 278 pps., library binding, $39.95

Except for a few Lon Chaney titles and German expressionist films, little is said about horror films made before *Dracula, Frankenstein* and *Dr. Jekyll and Mr. Hyde* were brought to life on the talking screen in 1931. This book catalogs no fewer than 1,130 silent films produced from 1896 through 1929 that preceded the full-blown chillers of later vintage.

Not all of these are horror pictures *per se,* but all contain essential elements of the genre, such as "haunted houses, ghosts, witches, skeletons, monsters, hypnotism, the occult, etc." Many of the earlier entries are the pioneering, innocent "trick films" of Meliés, Edwin S.

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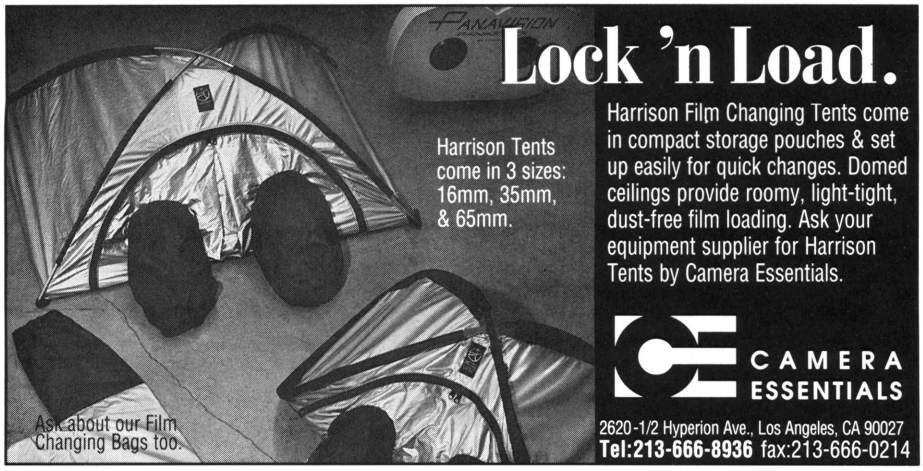

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Porter and their contemporaries. As the films became longer and more story-oriented there were adaptations from the weird tales of Poe, Stevenson, Hugo and — in 1910 — Edison's *Frankenstein.*

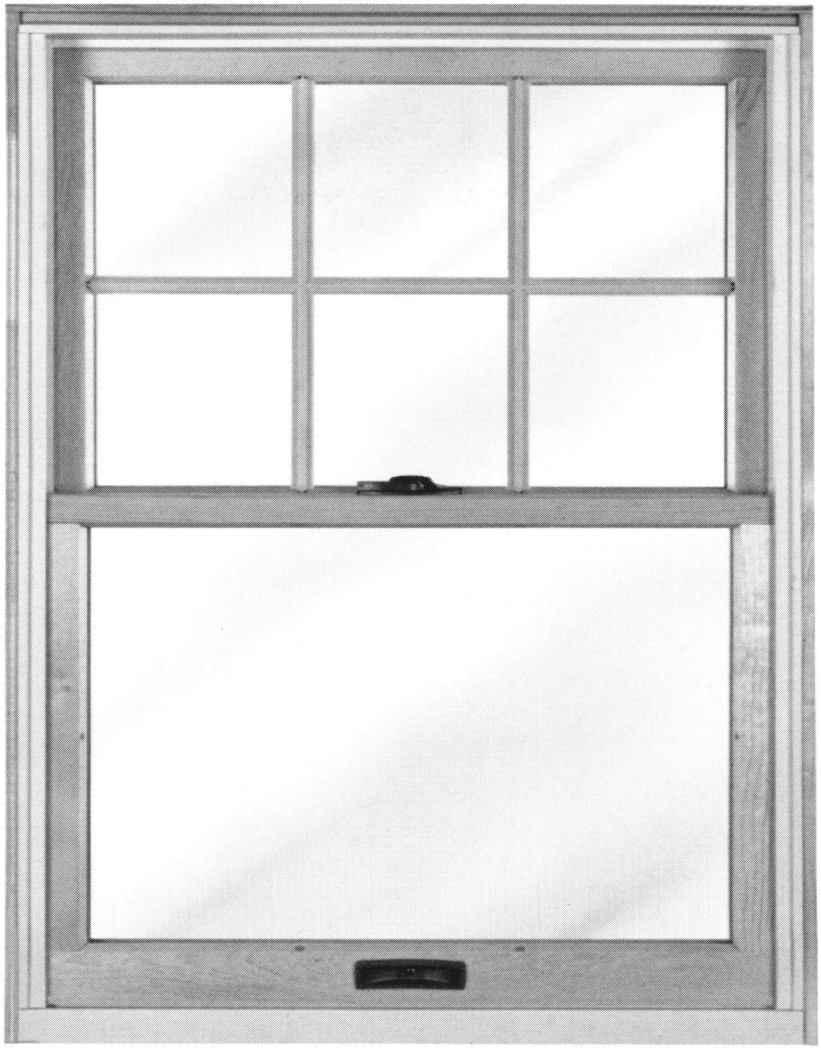
Interestingly, it seems clear that the art films from Germany, beginning in 1919 with *The Cabinet of Dr. Caligari,* had the strongest influence on the visuals of the American horror films of the sound era. The entire field, ranging from the 54-foot films of the 1890s to the multi-reel features and serials of 1929, is given a light once-over in this useful reference book.

Alfred Hitchcock: The Legacy of Victorianism
by Paula Marantz Cohen
University Press of Kentucky, 298 pps., cloth $34.95, paper $14.95

And still they come — books about Hitchcock, that is. This one, by a professor of humanities and communications at Drexel University, follows the director's development "from Victorianism to postmodernism." It is built mostly upon a scholarly study of four of his best — *Shadow of a Doubt, Rear Window, Vertigo,* and *Psycho.* By tracing his career from his early British films to his later work in America the evolution of his films is linked to larger sociological trends.

Family modes, psychoanalysis, history, gender roles and feminism are utilized heavily in this study. Considerable reliance is placed on Richard Spoto's "The Dark Side of Genius," which dealt in large part with Hitchcock's harassment of women. The author springs to Spoto's defense, stating that his book has been accorded an "undeserved reputation as a muckraking exposé." Opinions vary on this point.

Emphasis is placed on what is referred to as a "daughter's effect" on the films, resulting from Hitchcock's relationship with his only child, Patricia. Mention is made of Jane Wyman's definite resemblance to Patricia in *Stage Fright,* but it is less easy to discern the "equally striking resemblance" of Wyman's screen father, the lanky, egg-eyed Alastair Sim, to Hitchcock. The author, however, succeeds in illuminating her main thesis of Hitchcock's development from Victorian gentleman to a master of modern cinema.



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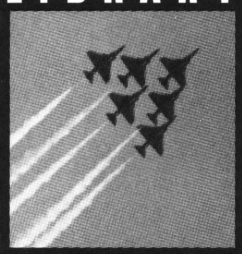

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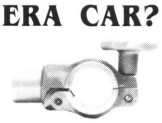

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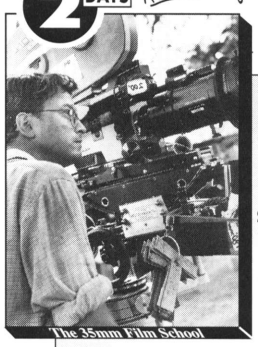

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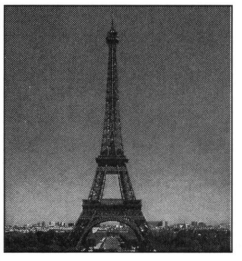

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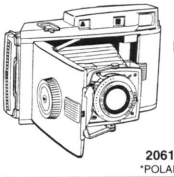

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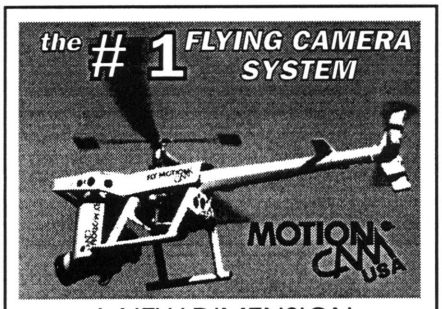

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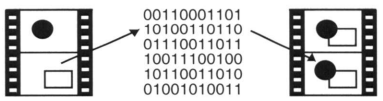

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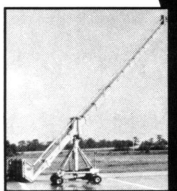
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From the Clubhouse

Irola Joins ASC

The ASC's newest member is Judy Irola, who has an extensive background in independent features and documentaries. In 1993 her feature *An Ambush of Ghosts*, profiled in our April 1994 issue, garnered her the Grand Jury Prize for Excellence in Cinematography at the Sundance Film Festival. Her first feature, *Northern Lights*, won the Camera d'Or at the Cannes Film Festival in 1979. In between these films her feature work included *Working Girls*, with director Lizzie Borden; *The Dead End Kids* with JoAnne Akalaitis; *Seguin* with Jesus Trevino; *Antigone* with Amy Greenfield; *The King James Version* with Robert Gardner; and *In the King of Prussia* with Emile de Antonio. Her last feature was *Override* (with Danny Glover directing) for Showtime.

After two years in Africa with the Peace Corps, Irola found work as a secretary at KQED-TV in San Francisco, where she spent her weekends working with the film department, learning how to load an NPR and shoot documentaries for PBS. In 1972 she and six others founded Cine Manifest, a film collective dedicated to making features reflecting the diversity of American society. *Northern Lights* was a result of their efforts.

Irola moved to New York in 1977, joined the I.A., and began working as a stringer for *60 Minutes*, *20/20*, *Real People*, *Odyssey*, *Nova*, the BBC, Granada, Canal Plus, and Channel 4. She also filmed eight segments of "Schiller's Reel" for *Saturday Night Live*, including the "La Dolce Gilda" skit with Gilda Radner.

Irola's television credits include *Lifestories*, a ten-part series for NBC, and numerous Movies of the Week. *Gangs* (ABC 1988) and *Date Rape* (CBS 1989) both won DGA awards for director Jesus Trevino. For Canal Plus, *Giancarlo Parretti: The Man Who Tried to Buy Hollywood* won first prize at the Venice Film Festival in 1991. *Journals I-III: The Work of Max Frisch* won the equivalent of an Emmy for Swiss television in 1990.

Throughout her career Irola has continued her documentary work, which has taken her to the former Soviet Union, Brazil, Mexico, Mozambique, Cuba, Grenada, and Spain, England and Denmark. She spent last six months filming a four-hour documentary for PBS on the Catholic Church, a project which had her traveling to Paris, Amsterdam, Rome, Krakow, Warsaw, Nairobi, Mexico City, Chiapas, and most of the United States.

Irola is currently shooting a narrative for German television directed by Percy Adlon (*Bagdad Café*). When she is not shooting she serves as a professor at the University of Southern California, teaching cinematography.

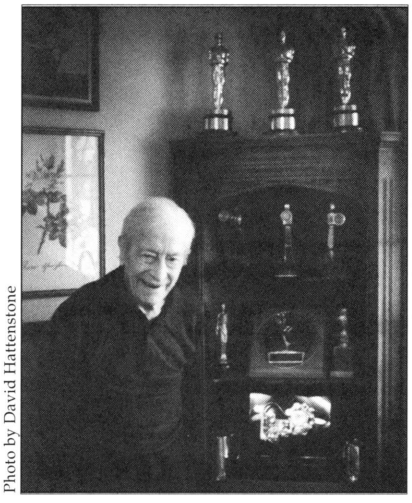

Photo by David Hattenstone

AC Goes Abroad

In an attempt to stay in touch with our international readership, *American Cinematographer* recently sent "staff envoys" to Amsterdam, Munich and London.

The trip began with Executive Editor Stephen Pizzello and Advertising Sales Director Angie Gollmann attending the bustling International Broadcast Convention in Amsterdam, which was held at the RAI Convention Center from September 14-18. During the show, the duo met with a series of European equipment manufacturers and distributors to get the latest information on professional products and services.

After IBC, Gollmann headed to Munich to investigate the convention floor at ShowBiz Europe, while Pizzello flew to London to meet with the cream of England's film industry. The Britishers' reputation as impeccable hosts was soon confirmed. On his first day in Jolly Old England, the *AC* editor was treated to a full factory tour by senior executives at the Quantel Corporation, makers of increasingly popular digital compositing tools such as the Henry and Domino. The following afternoon, Pizzello toured Pinewood Studios, where he strolled the grounds with Finance Director Robin Busby and lunched with Samuelson Lighting President Michael Samuelson, former BSC President Harvey Harrison and former Eastman Kodak Motion Picture and Television Division executive Geoff Cadogan. That same day, he also visited Shepperton Studios, where Roger Lofting of the Magic Camera Company detailed some of the firm's recent work on the new James Bond film *GoldenEye*.

AC is pleased to report that Pizzello was also wined and dined by several other especially prominent members of the British film community. On his second night in London, he joined Freddie and Joan Young and Michael Samuelson for dinner at the home of David and Elaine Samuelson. Not to be outdone, the Youngs played host at their home in the nearby suburb of Barnes several days later. The Youngs' guest list also included cinematographer Ernest Day, BSC (*A Passage to India*) and his companion, Rosemary, as well as cinematographer Bob Huke, whose credits include *Virgin and the Gypsy* and the stunning aerial footage for *Battle of Britain* and the James Bond film *You Only Live Twice* (on which he worked alongside Young, who handed the first-unit photography).

Needless to say, Pizzello and the ASC would like to express a heartfelt "thank you" to all of the above-mentioned people for their kindness and hospitality. Their congeniality helped make *AC*'s transatlantic foray a rousing success.

Left: *Freddie Young, BSC, OBE poses at home with some of his cinematography awards, including three Academy Awards for* Doctor Zhivago, Lawrence of Arabia, *and* Ryan's Daughter.

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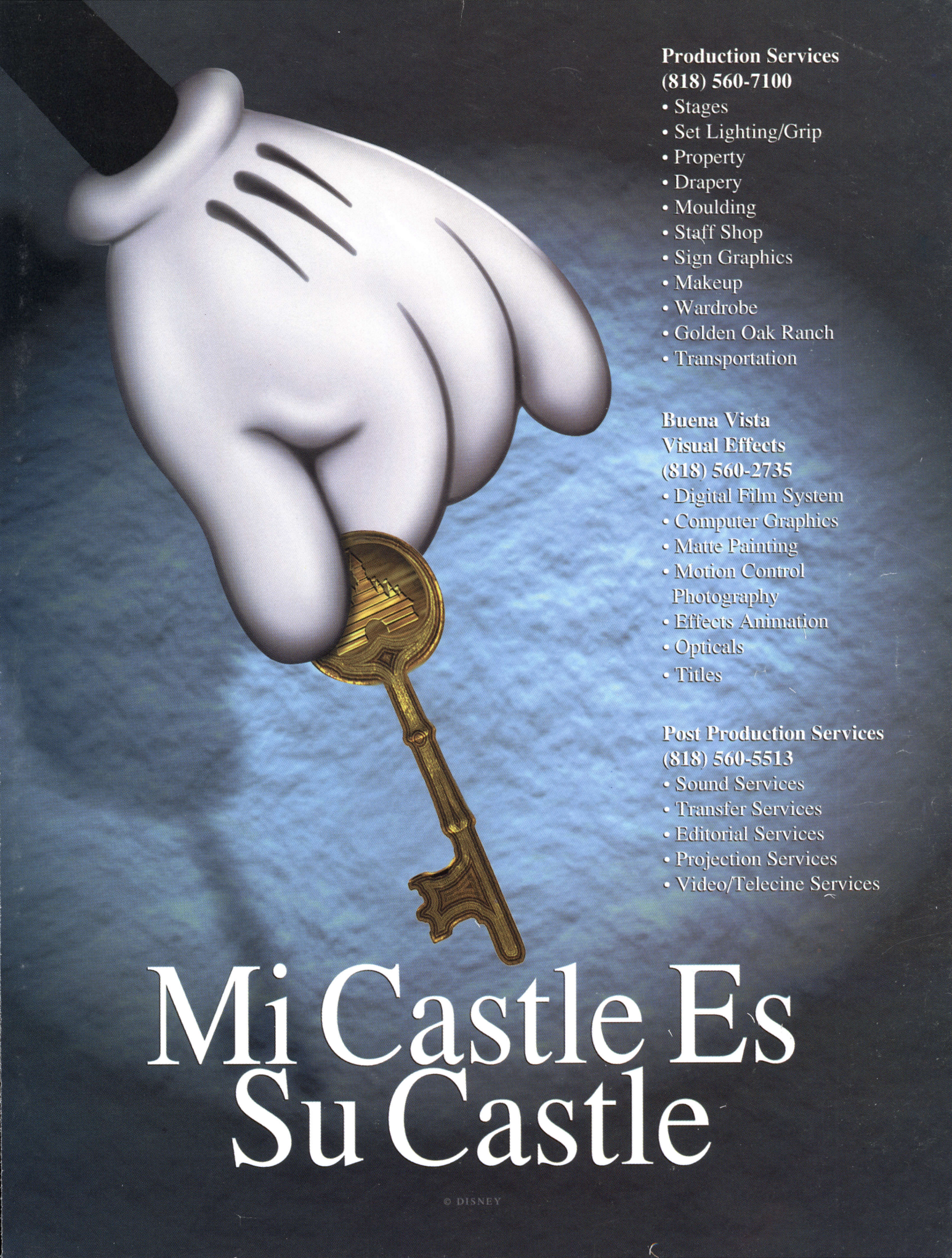
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